

HISTORIC STRUCTURE REPORT  
ARCHITECTURAL DATA SECTION  
FCRT MOULTRIE

Arch Data Section

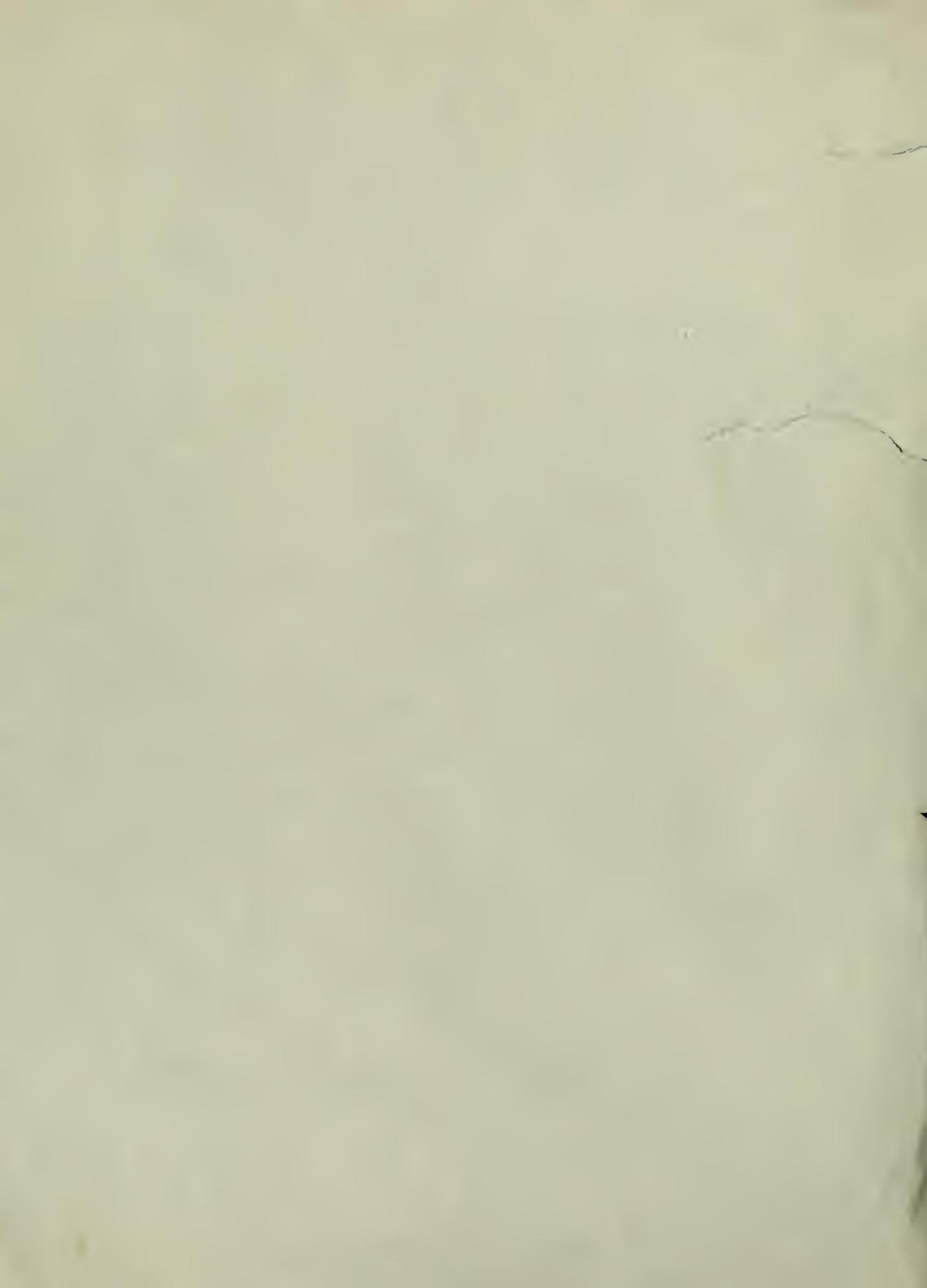
FORT SUMTER NATIONAL MONUMENT

CHARLESTON  
SOUTH CAROLINA

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PLANNING AND DESIGN DIVISION  
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UNITED STATES DEPARTMENT OF THE INTERIOR

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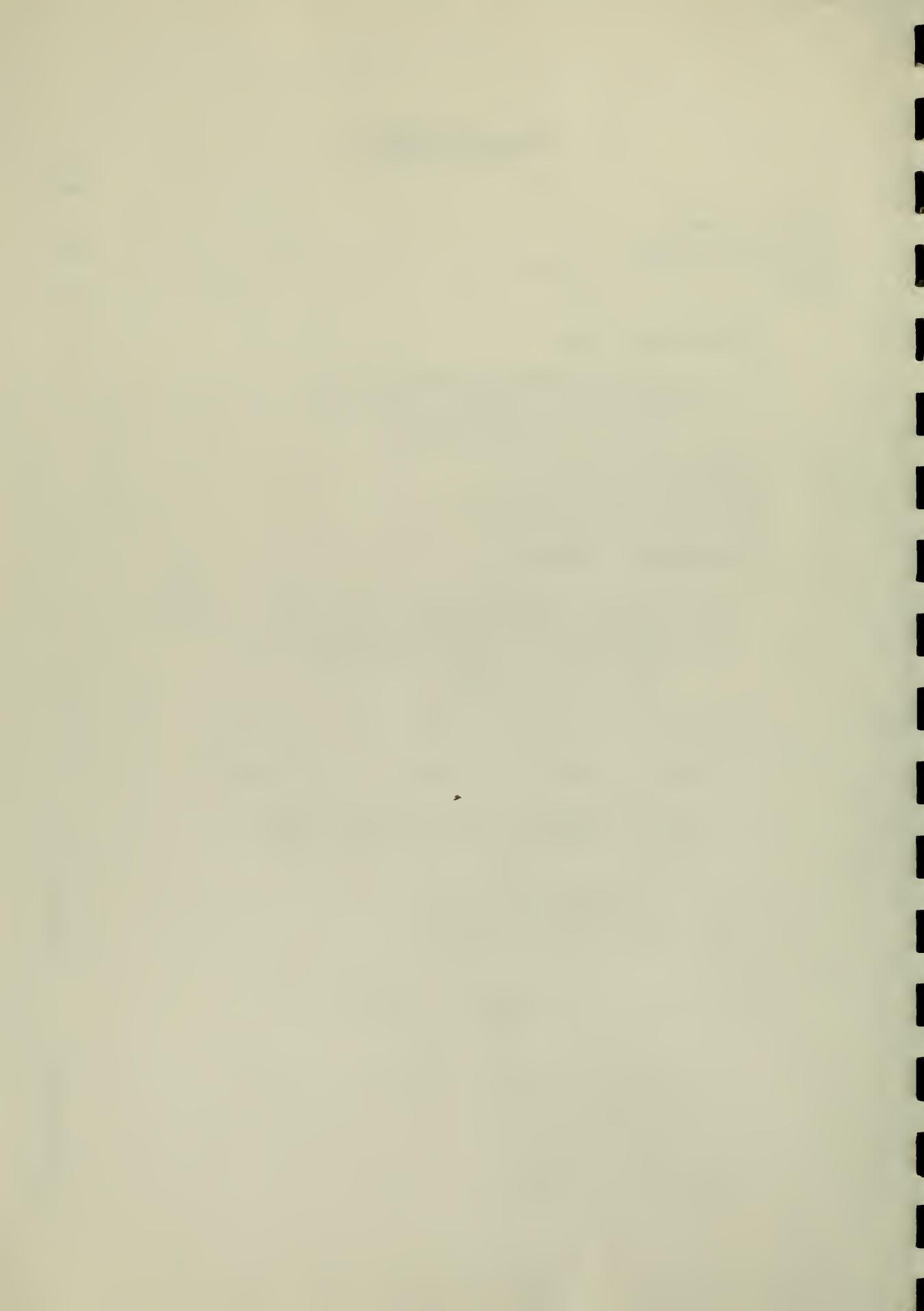


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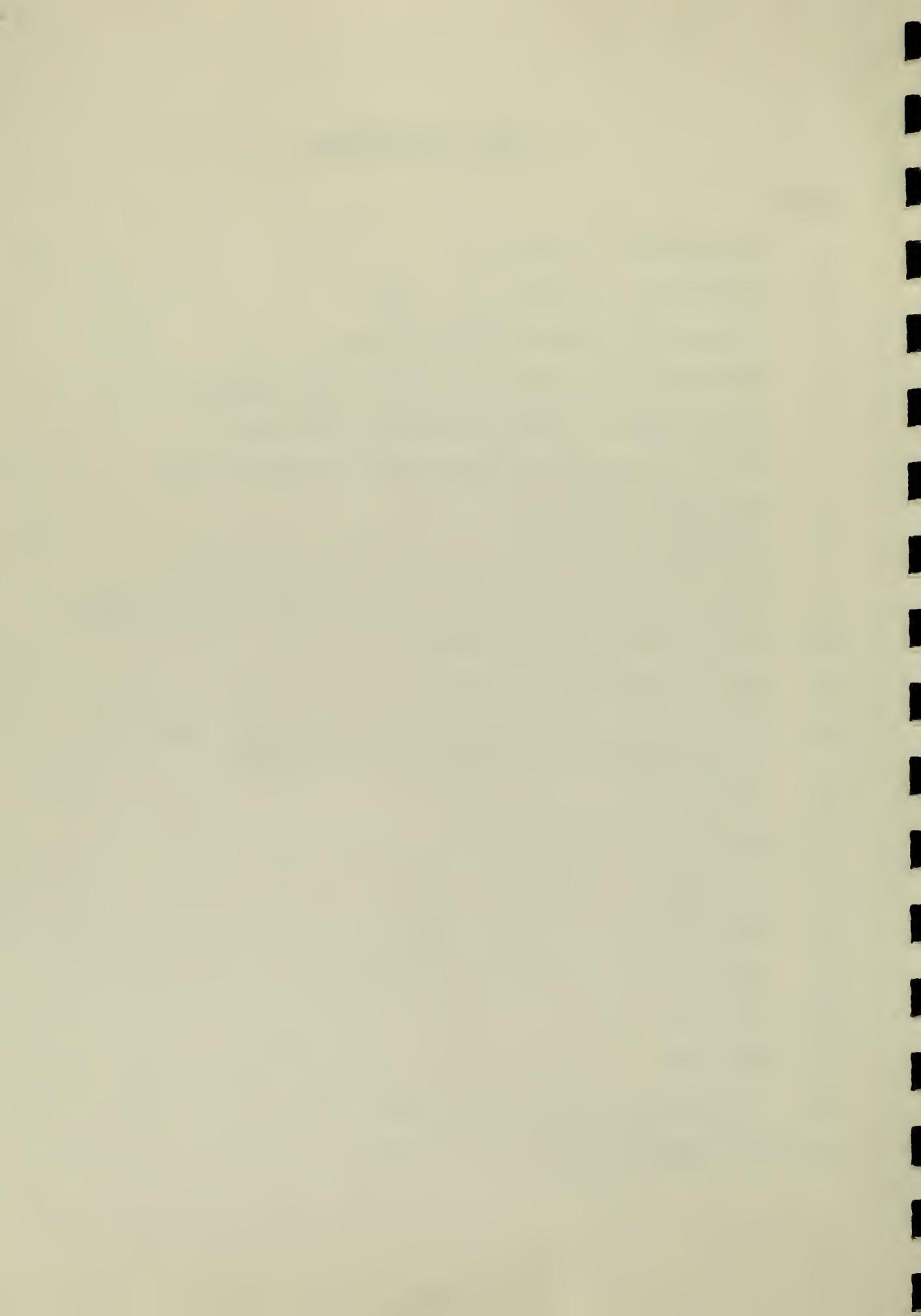
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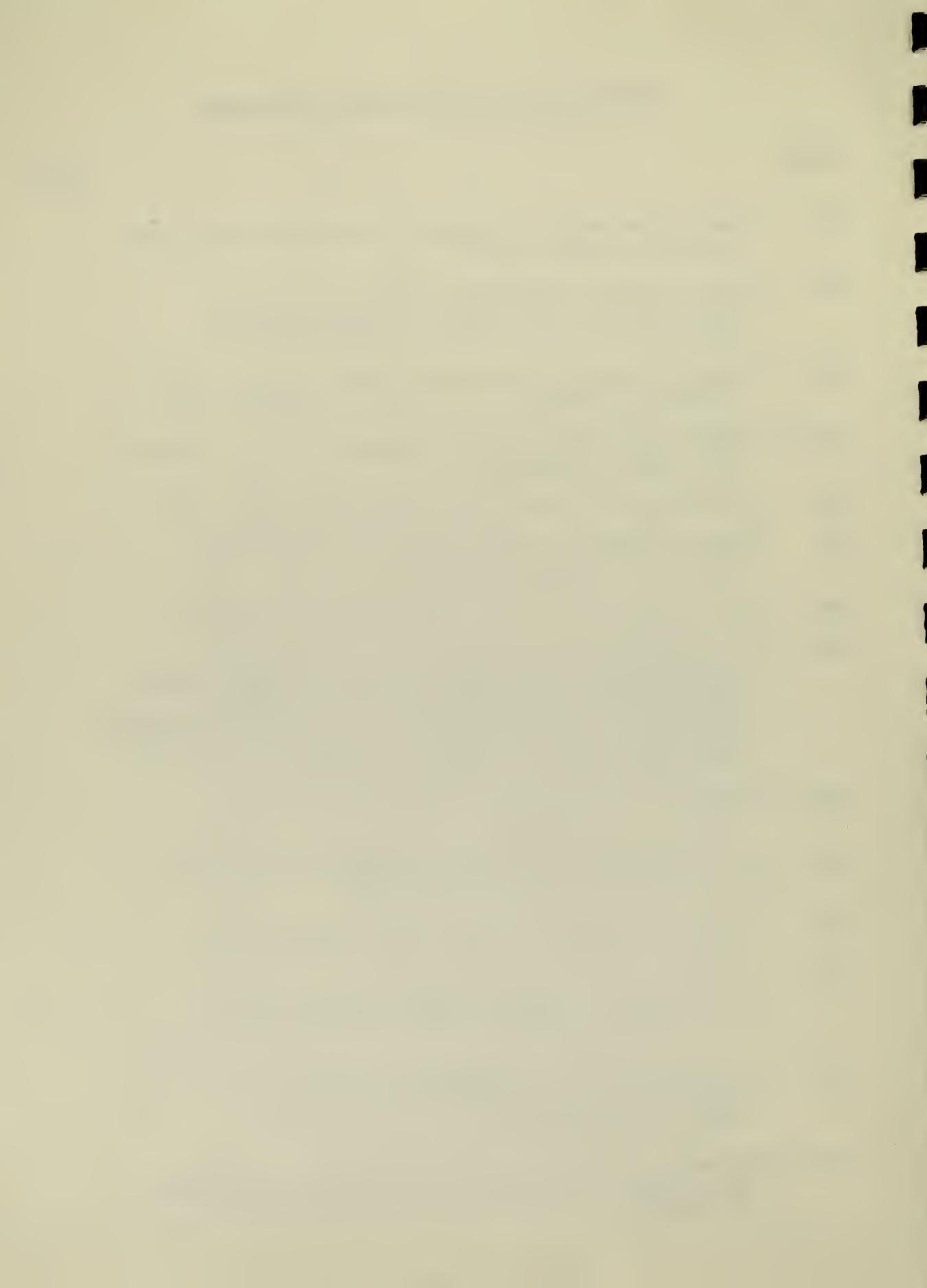
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## FOREWORD

This report was prepared to satisfy the research needs as enumerated in Historical Research Management Plan, Fort Sumter National Monument, June 1968 for the Architectural Data Section of the Fort Moultrie Historic Structure Report. Although this report centers primarily on Fort Moultrie III, erected in 1808, it attempts to cover also Fort Moultrie I, 1776-1783, and Fort Moultrie II, 1794-1804.

Thanks are due to Superintendent William Harris and his staff for their exemplary assistance and cooperation at the site; to Mr. Edwin C. Bearss, Supervisory Historian, National Park Service, for sharing his vast knowledge of the history of the Fort Moultries and for his generous assistance and encouragement; and to Mrs. Lillian Braun for the many hours she spent typing and proof-reading the preliminary and final drafts.

J. C. G.

Atlanta, Georgia  
December 1973



## I. ADMINISTRATIVE DATA

### A. Identification and Proposed Treatment

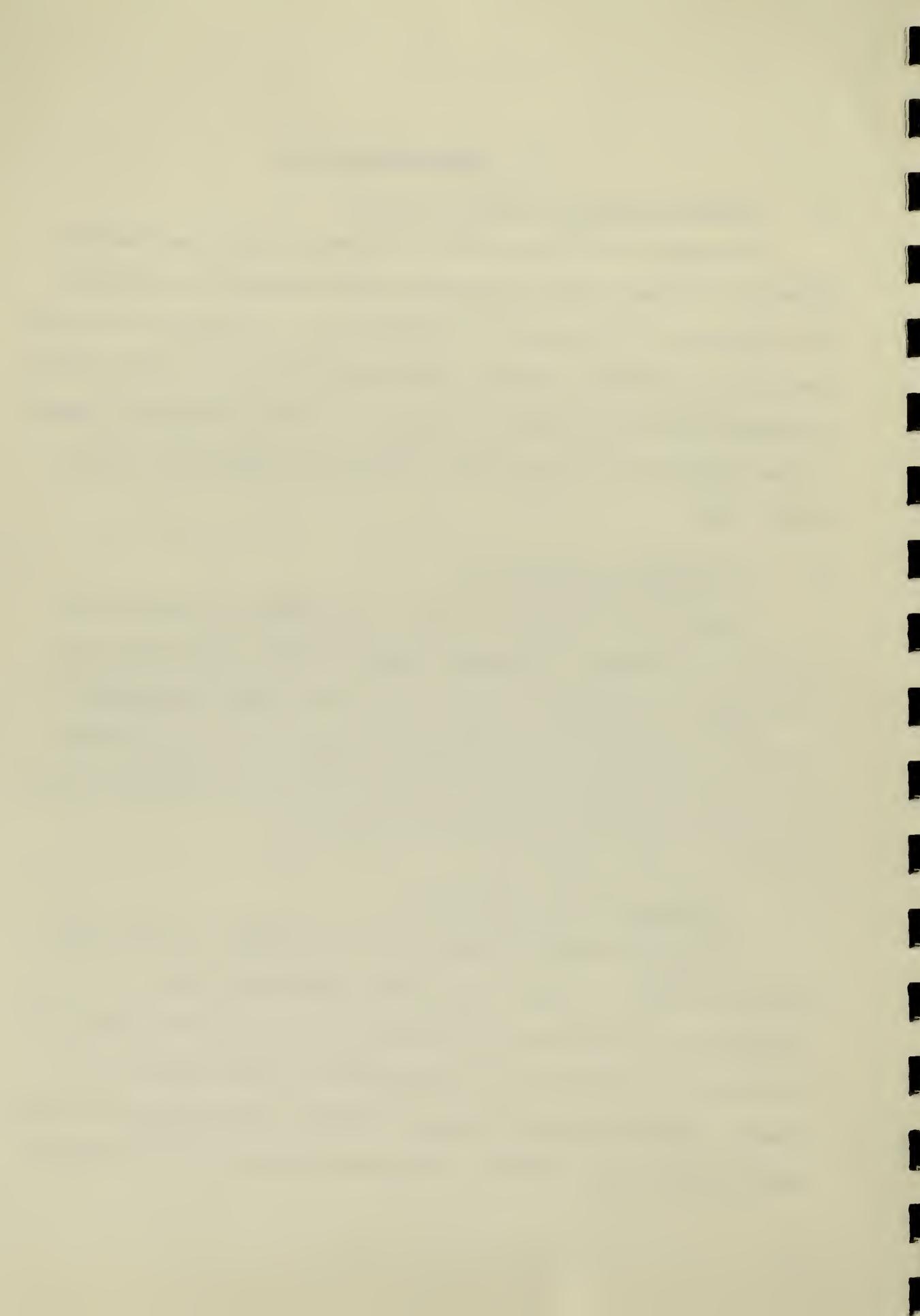
Fort Moultrie, Historic Structure Number 2, Fort Sumter National Monument, Sullivan's Island, Charleston, South Carolina, is classified as a structure of "First Order of Significance." It is proposed that the fort will be preserved, restored, and reconstructed in its various parts, including partial furnishing and armament, to selected appropriate phases of its history as it existed during its period of maximum development, 1808 - 1945.

### B. Proposed Use of Structure

Fort Moultrie shall constitute a major exhibit-in-place of the evolution of 200 years of American coastal fortifications, erected for the defense of important harbors of the United States. Fort Moultrie is the only fort owned by the Service which encompasses within its walls, or contiguous thereto, defensive fortification elements representative of the major historic periods of this two-century era.

### C. Justification for Proposed Use

The Congressional Joint Resolution to establish the Fort Sumter National Monument was approved April 28, 1948 (62 Stat. 204). In the language of the Resolution the Secretary of the Interior was authorized to accept title "to the site of the historic structure known as Fort Sumter...together with such buildings and other improvements as are appurtenant to such site." Further, "The property acquired by the Secretary

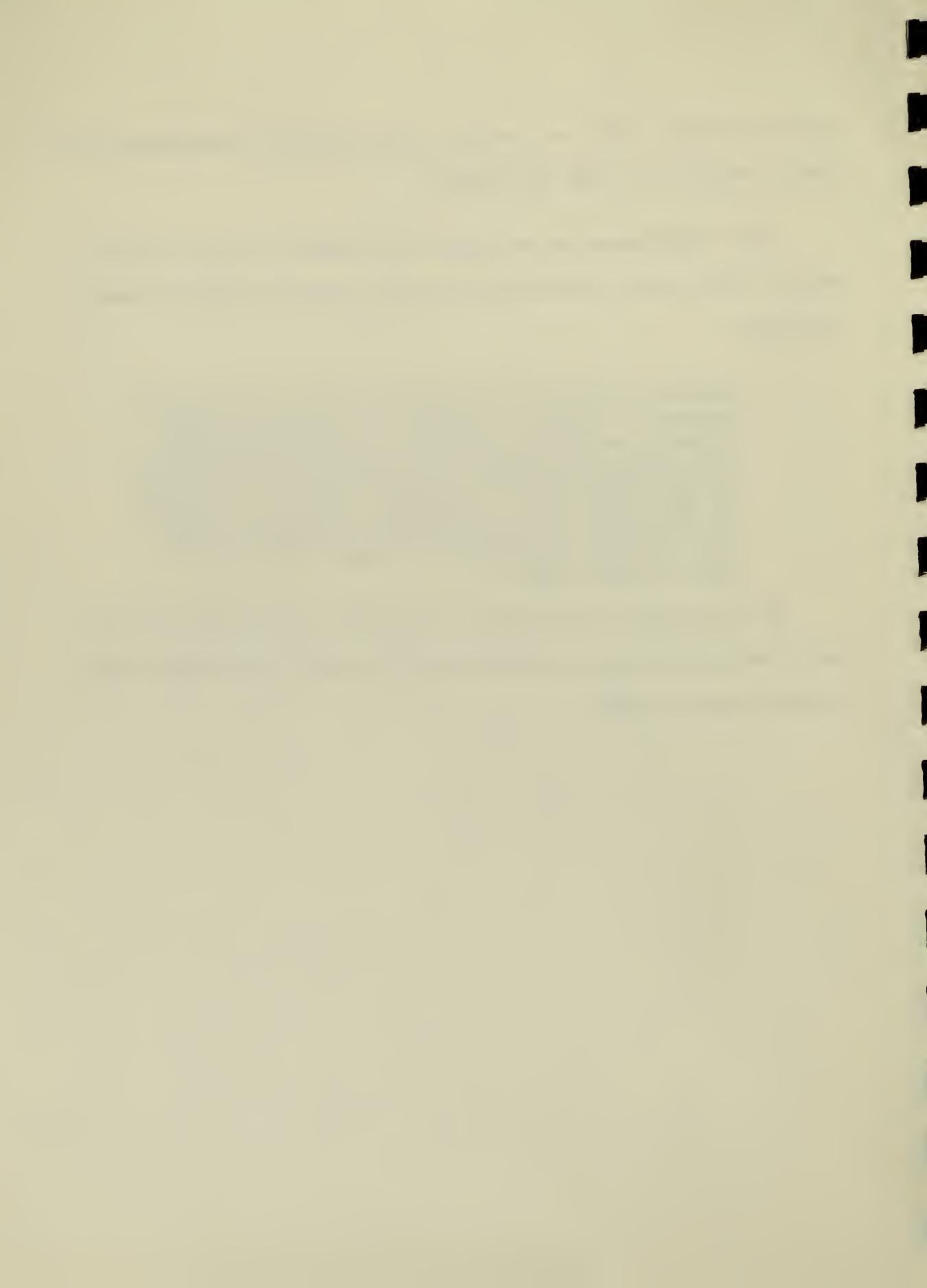


of the Interior...shall be a public national memorial commemorating historical events at or near Fort Sumter."

Deed reconveyances to the Federal Government of some of the Fort Moultrie lands during the 1960-1967 period carry the following general statement:

Whereas the party of the second part [U. S. Government] proposes to utilize a portion of the above described property for National Monument and National Historic Site purposes by making certain improvements and developing facilities for the use and benefit of the people of the United States in accordance with the provisions of the National Monument Act, June 8, 1906 (34 Stat. 225) and the National Historic Sites Act, August 21, 1935 (49 Stat. 666)...

The Interpretive Prospectus, Fort Sumter, approved June 12, 1973 calls for the development of the historic resource in accordance with Sections A and B above.



## II. HISTORICAL DATA SECTION

The Historical Data Sections have been prepared by Mr. Edwin C. Bearss,  
published as two separate volumes, titled:

THE FIRST TWO FORT MOULTRIES,  
A STRUCTURAL HISTORY  
Fort Sumter National Monument  
June 30, 1968

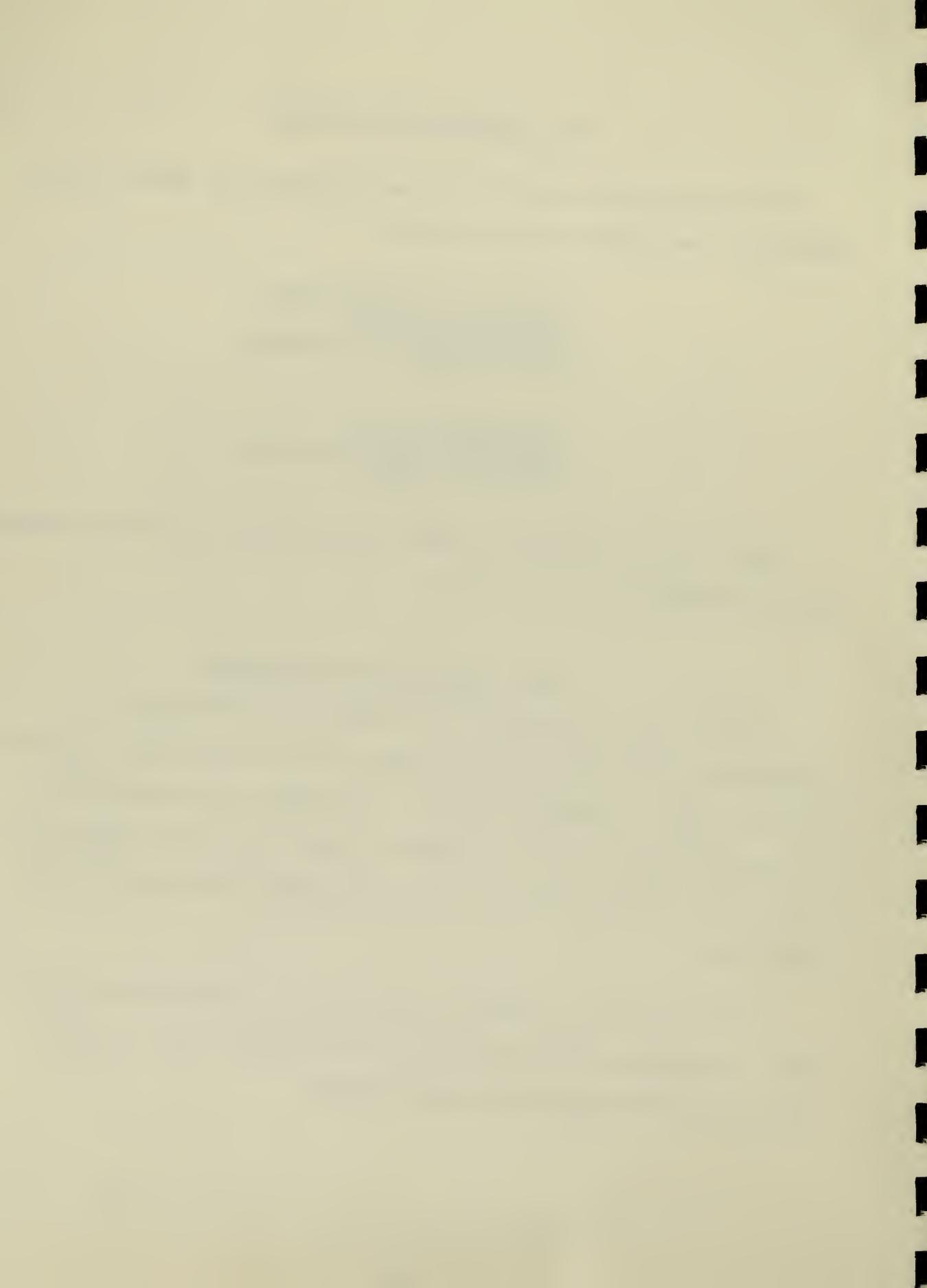
FORT MOULTRIE NO. 3  
Fort Sumter National Monument  
December 30, 1968

These works are definitive studies and have served as the basic sources  
for the documentation of this report.

## III. ARCHEOLOGICAL DATA SECTION

An archeology excavation by the Institute of Archeology and Anthropology, University of South Carolina, has been placed under contract by the Southeast Archeological Center. The purpose is to determine the location of Fort Moultrie I (1776-1783) as well as to uncover remains of Fort Moultrie II (1798-1804) and selected features of Fort Moultrie III (1808-1945).

The field work is scheduled to terminate by the end of December 1973, with a preliminary draft report due by the first of the year and final report of the findings by the summer of 1974.



#### IV. ARCHITECTURAL DATA SECTION

Original drawings made during the historic periods of active use of Fort Moultrie III(1808-1945), as well as its two predecessors, are deposited with the National Archives in Washington, D. C. as are numerous reports, letters and various correspondence narrating conditions, problems, proposals and changes during the active life of the fort. Narrative records for the period subsequent to 1868 are on file at the East Point Record Center, East Point (Atlanta), Georgia. Photostatic and Xerox copies of the significant drawings and narratives are also on file at Fort Sumter National Monument.

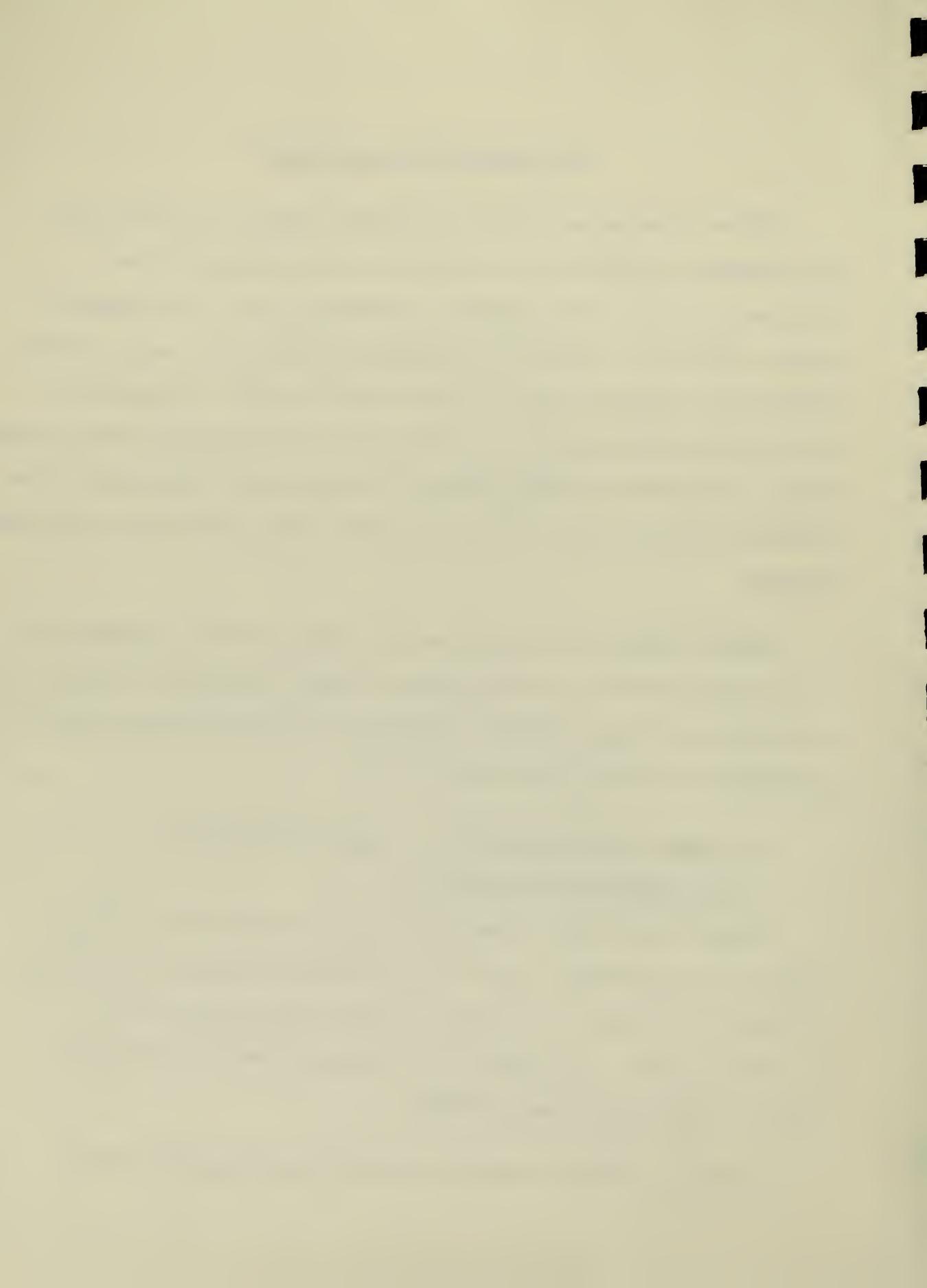
Although study has indicated that the drawings are not infallible and the narrative records are often missing or silent on specific subjects, the combined body of data, properly interpreted, yields an accurate account of the physical evolution of the several forts.

##### A. SUMMARY OF DOCUMENTARY DATA - FORT MOULTRIE I & II

###### 1. THE LOCATION OF FORT MOULTRIE I

Within recent years, increasing interest in the location of Fort Moultrie I has stimulated research and documentation activity on the part of National Park Service Historians. Notable among these has been Mr. Edwin C. Bearss, now Supervisory Historian, Historic Preservation Project - East, Denver Service Center.

On June 30, 1968 the National Park Service published Mr. Bearss'



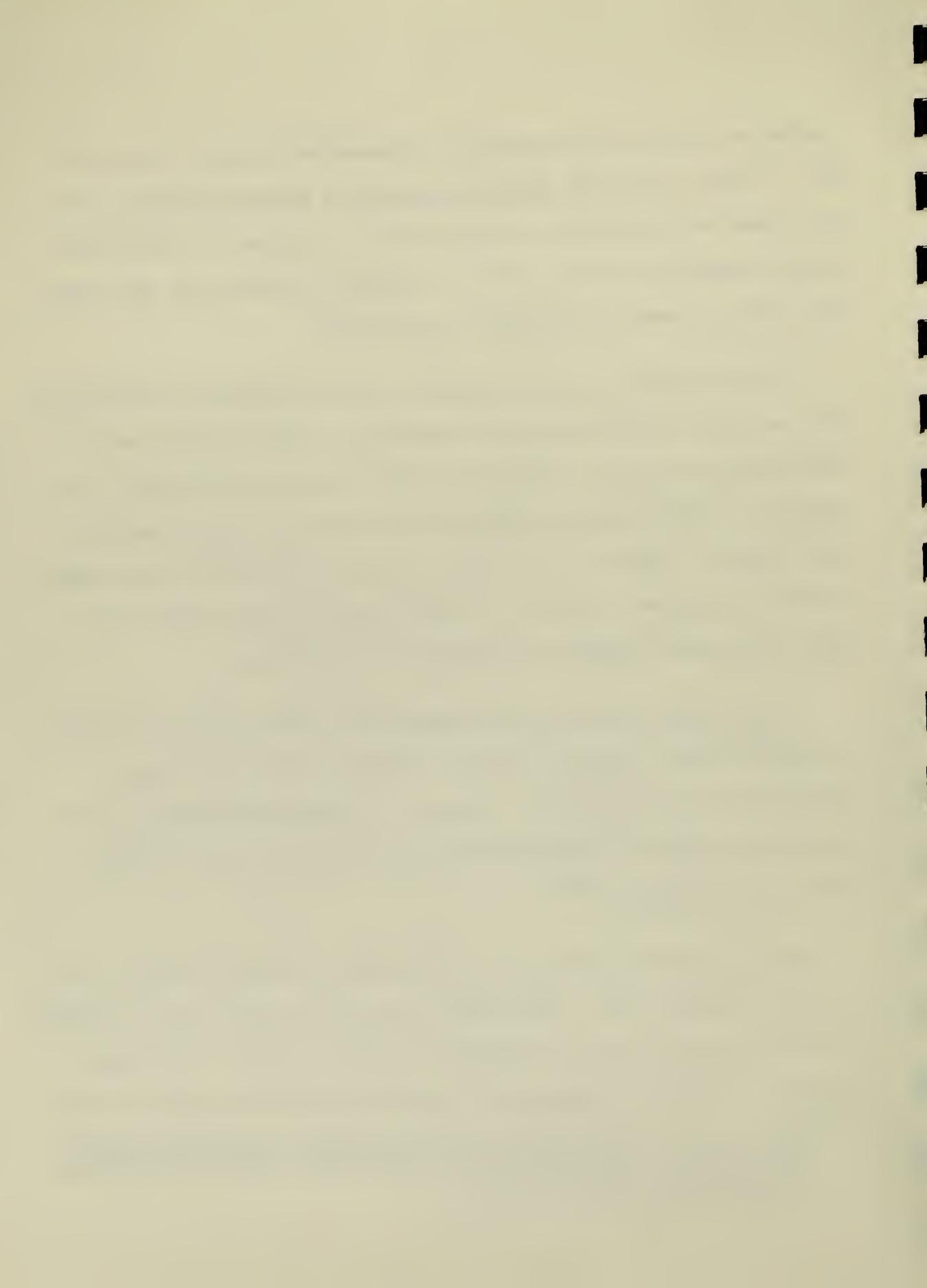
definitive study of the historical documentation relating to the first fort. Titled: The First Two Fort Moultries, A Structural History, this study provoked considerable interest with its conjectured identification of the location of the fort and the consequent inference that the remains were findable through archeological processes.<sup>(1)</sup>

This stimulating idea was contrary to previous popularly held beliefs that the site of the fort had been washed away, without a trace, by the encroachment of the sea. During the course of this present study a re-analysis of the historical documentation bears out the general veracity of Mr. Bearss' conjecture. The site of the 1776 Fort Moultrie does appear to lie in the general area of the present Fort Moultrie, however, its exact siting still remains to be verified by archeology.

A tantalizing clue as to the whereabouts of Fort Moultrie I is found in Captain Bowman's reports of 1839. In 1832 Fort Moultrie III was threatened by the encroachment of the sea. Following the destruction of the southwest angle in that year efforts were made to protect the fort from further destruction.<sup>(2)</sup>

In 1833 a series of wood cribs filled with stone were erected 75 feet from the south sea front. These cribs were initially successful in halting the sea erosion but further inundation in 1839 resulted in additional measures. In that year Captain A. H. Bowman was placed in command of the

1. Bearss, Edwin C: The First Two Fort Moultries, A STRUCTURAL HISTORY  
Fort Sumter National Monument, National Park Service, U. S. Department  
of the Interior (June 30, 1968)
2. Bearss, Fort Moultrie III, pp 71-72



work. Bowman determined that a series of rock jetties was the ultimate answer to the problem and in May 1839 he began his first "grillage."

During the construction of the second jetty or "grillage", Bowman discovered a brick foundation which he reported to Colonel Totten, the Chief Engineer:

While sinking section No. 5 of this grillage, I discovered the foundation of Old Fort Moultrie, which common report had placed much farther to the south and east - to satisfy myself fully that the mass of masonry discovered was the foundation of the old Fort, I made a careful examination, tracing out, without difficulty the direction of the walls - Subsequently I was enabled to detach portions of the brick masonry, with the mortar adhering - the grillage crosses this foundation; section No. 5 being placed over a part of it - The fact that this masonry has remained so many years on a level with the sand, removes any apprehensions of the sinking [subsidence] of the grillage...<sup>(3)</sup>

Unfortunately Bowman's drawings of these jetties have not been found and the exact location of Section 5 of Jetty 5 remains conjectural at this time.

It has been conjectured that Bowman actually had crossed the brick foundation of Fort Moultrie II. However, a thorough analysis of all

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3. Bowman to Totten, July 6, 1839



available documentation indicates that this would be virtually impossible. There can be no doubt that Bowman found a foundation associated with Fort Moultrie I. Until Jetty 5 can be identified though and the brick foundation unearthed and analyzed it remains for us to speculate whether they are a part of the fort itself or of an outwork.

## 2. ARCHITECTURAL DETAIL OF FORT MOULTRIE I

Architectural detail for the first Fort Moultrie is found in only meager references of the time. The present archeology exercise, after six weeks of field investigations, has not yet discovered any substantive architectural remains with the exception perhaps of the remnants of an abatis.

When Fort Moultrie I is the subject of discussion it is necessary to make a distinction between the 1776 Fort Moultrie and the 1780 Fort Moultrie. The 1776 fort, according to all documentary sources, was an unfinished construction. Ledger entries of the South Carolina treasury, as well as other sources, indicate that the fort was substantially completed between September 1777 and January 1780.<sup>(4)</sup>

There seems little doubt as to the plan configuration of Fort Moultrie I in both its periods. It was designed in the form of a square with bastions at each of the four corners. In military engineering terms this would be categorized as "a square fort."

4. MS., Commissioners of the treasury Journal, 1777-1780, State of South Carolina, found in State Archives, Columbia, S. C. A total of £327,230.07 was spent during this span of time for all of the fortified works on Sullivan's as well as the bridge to the mainland.



Colonel William Moultrie of the 2nd South Carolina Regiment found himself in charge of Charleston defenses in the spring of 1776.<sup>(5)</sup> He stated in his memoirs:

On the second of March [1776] I was ordered down to Sullivan's Island, to take command; where we were building a large fort sufficient to contain 1000 men. As this was looked upon as the key of the harbor; a great number of mechanics and negroe laborers were employed in finishing this fort as fast as possible...<sup>(6)</sup>

From an earlier reference by Moultrie it appears that the fort was begun in January 1776:

1776. Early in January we were preparing to build a fascine battery on Sullivan's Island, and on the 10th I issued the following order.

'Orders,

Jan. 10th, 1776

One capt. 2 subalterns, 2 sergeants, and 50 rank and file, from the 1st regiment, and 1 capt. 2 subalterns' 2 sergeants, and 50 rank and file, from the 2d regiment, hold themselves in readiness to take post on Sullivan's Island, there to remain as a covering party to the men who were to be employed on the Island in building a fascine battery.'<sup>(7)</sup>

The "fascine battery" could be the beginning of Fort Moultrie which, by Moultrie's account, was under construction by March 2. Moultrie further relates regarding this Sullivan's Island battery that on January 12, 1776 the Council of Safety ordered Moultrie "...to order the commanding officer

5. Bearss, The First two Fort Moultries, p. 3

6. Wm. Moultrie, Memoirs of the American Revolution..., (New York, 1802), 1, p. 124

7. Ibid., p. 116



of the detachment on Sullivan's Island ["It was then quite a wilderness, and a thick deep swamp, where the fort stands, covered with live oak, myrtle, and palmetto trees."] as soon as the intended temporary battery is in readiness, to fire upon any ships...to prevent the enemy's landing or passing by."<sup>(8)</sup>

At some date prior to June 28, 1776, Moultrie described the scene:

...our fort at this time was not nearly finished; the mechanics and negro laborers were taken from all the works about the town, and sent down to the Island to complete our fort, we worked very hard, but could not get it nearly finished before the action.<sup>(9)</sup>

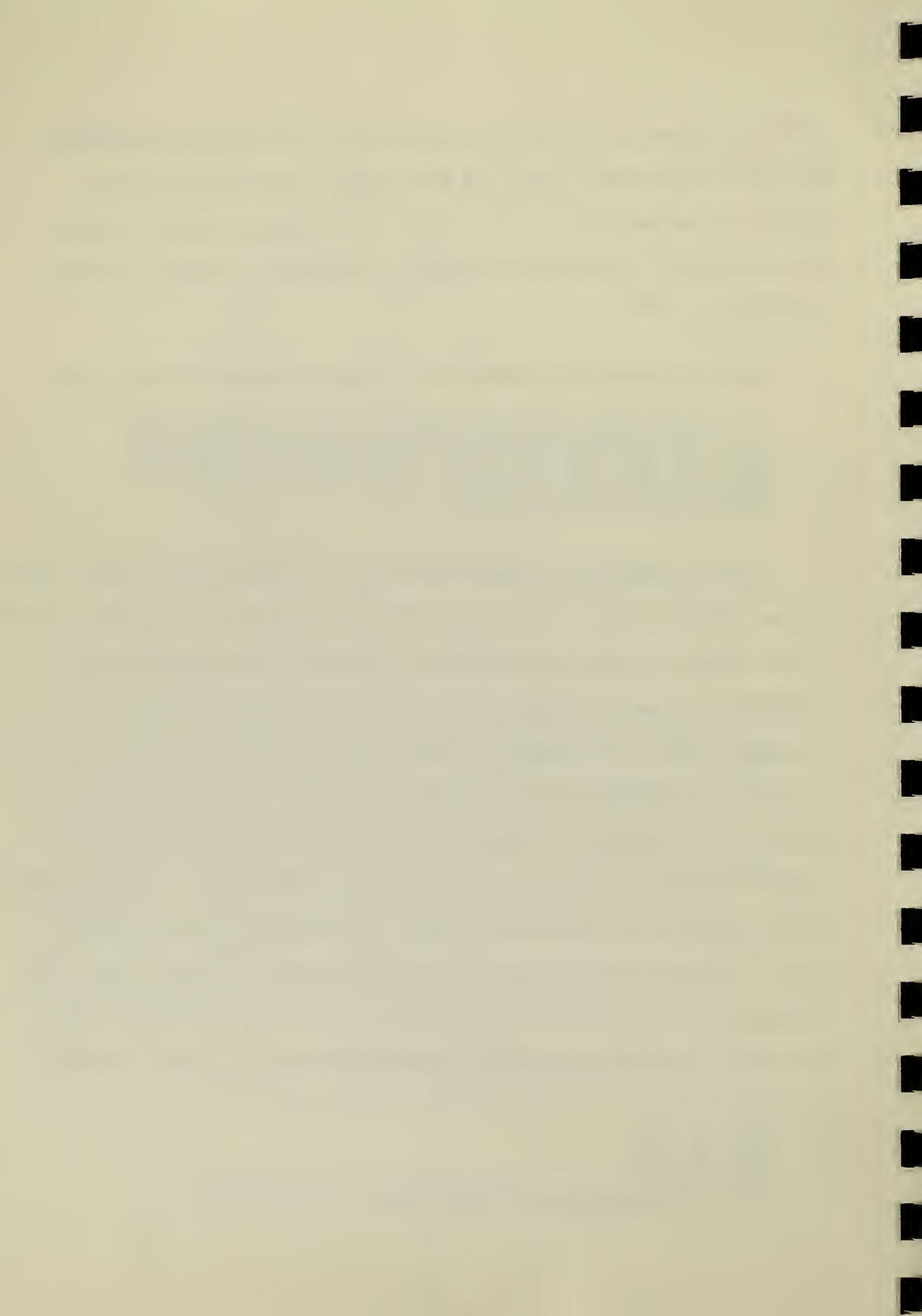
By June 3, Moultrie reported "Our fort is now enclosed..."<sup>(10)</sup> however it was "finished only on the front or southeastern curtain and bastion, and on the southwest curtain and bastion..." while the remaining walls were temporarily raised with planks by the end of the month. The fort was designed so that when completed it would hold 1,000 men. It was built of palmetto logs [supplied by Mr. Dewees; to be "not less than ten inches in diameter in the middle. One third to be 18 feet long; the rest 20 feet long."<sup>(11)</sup>] laid one upon the other, in two parallel rows at 16 feet apart, bound together at intervals with timber dove-tailed and bolted into the logs. The space between the two lines of logs was filled with sand. The merlons were walled entirely by palmetto logs, notched into one another at the angles, well bolted together, and strengthened with pieces of timber.

8. Ibid., p. 122

9. Ibid., p. 144

10. Ibid., p. 146

11. Bearss, The First two Fort Moultries, p. 4, footnote 5



They were 16 feet thick, filled in with sand, and ten feet above the platforms. The platforms were supported by brick pillars ["For their platforms, the soldiers used two-inch plank, nailed down with spikes."(12)]"(13)

Several contemporary drawings support this general view of the state of construction and completion of the fort by the time of the battle with the exception of the merlons which were reported to have been riddled.(14)

The only contemporary view of the 1776 Fort Moultrie is an English drawing of the fort from a ship at sea. The drawing bears the caption:

Remarks-...NB. The Thickness of the Merlons was 16 feet and the length of the Fort, from the Salient [sic] Angle of the West, to that of the East Bastion, 550 feet. The whole Work strong and well made.

(For this drawing, see Plate )

Immediately following the attack, work was continued on the fort. On July 1, 1776, General Charles Lee, Moultrie's commander wrote:

Huger's regiment have offered themselves to work at your fort. I believe a corps of blacks would have answered better ...The carpenter's I hope will soon finish the gate.(15)

On July 6, Lee wrote saying: .

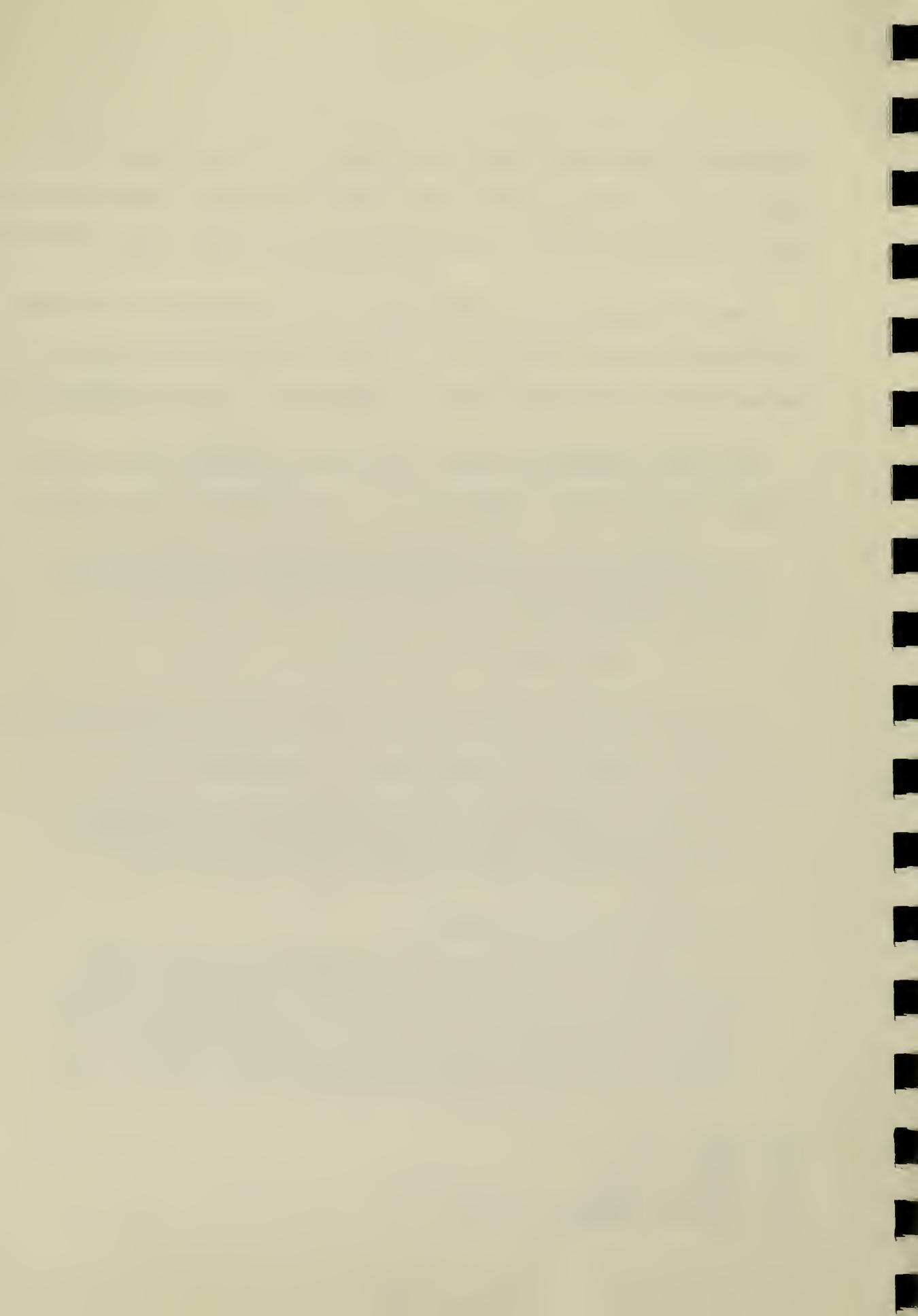
I am extremely concerned that the materials are not provided, which are necessary for carrying on, and finishing the works proposed in your fort and island; but at the same time I think the negroes you have with you, may be usefully employed...they may fill up the merlons which are not yet full...they may palisade (for I believe you have palisades sufficient) the low

12. Ibid., p. 4

13. Ibid., pp. 8-9

14. Ibid., p. 11

15. Moultrie, Memoirs, p. 172



and most assailable parts of your embrasures and angles. (16)

Work was apparently not resumed on Fort Moultrie and the Sullivan's Island fortifications until the fall of 1777. From that time until January of 1778 expenditures for the following were made:

Unspecified costs	£160,398.14
Carpentry work	10,234.17
Palmetto logs	9,147.02
Misc., including labor, water, wages & supervision	6,822.98
Cart and Wagon hire	6,314.00
Timber, boards, scantling, etc.	6,109.26
Bricks (approx. 200M)	1,889.00
Schooner hire	1,408.00
Lime (approx. 3,000 bu.)	832.17
Total	£203,152.74 (17)

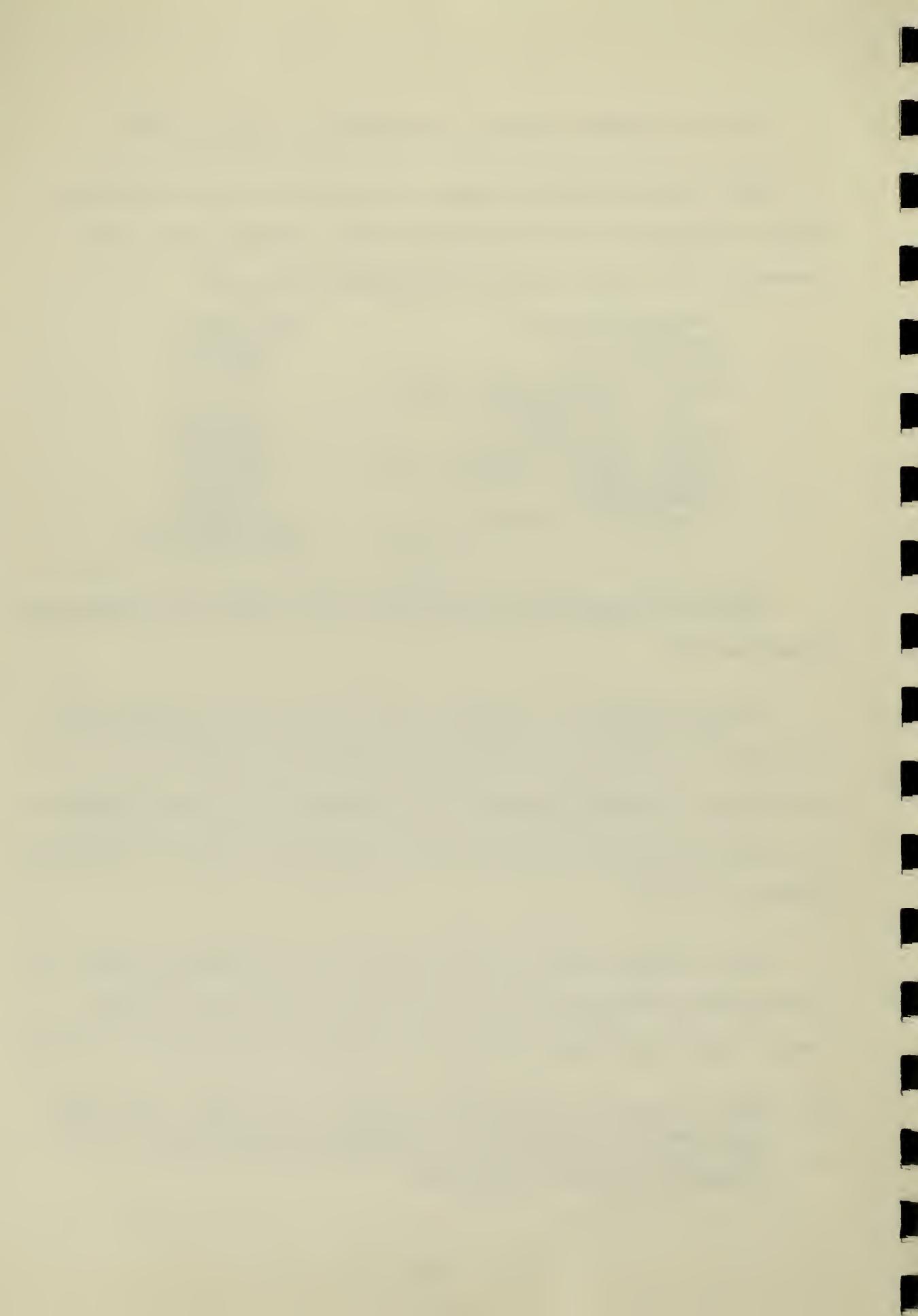
Additional contemporary accounts lend little additional enlightenment about the fort.

Colonel Pinckney, in command at Fort Moultrie in 1777-1778, issued an order on December 24, 1777, that the Quartermaster Sergeant was "...to have all the Chimneys Swept Under the platform without Delay, if this is not properly done where they have Rooms they are to Inform the Commanding Officer of it." (18)

This reference seems to indicate that there were casemate-like rooms, complete with fireplaces in which some of the troops were quartered. A French Intelligence Report of ca. 1778 referred to Fort Moultrie as having

17. "Commissioners of the Treasury Journal." pp. 11-288. This equals approximately \$812,608.00 a considerable expenditure for the time.

18. MS. "Orders by Colo. Pinckney, Fort Moultrie, 1777-1778.", Charleston Historical Foundation.



"a double battery," which may mean to imply casemates. (19)

Although it was reported by Drayton that when the South Carolina troops moved into Fort Moultrie in June 1776, they razed their "...huts and booths covered with palmetto leaves..." it appears that new quarters must have been erected later. (20) On December 29, 1777, the Second Regiment was ordered from Charleston to Fort Moultrie:

...they may move their Baggage, etc, as soon as convenient [sic] no huts or Buildings about the fort is to be hurted or demolished on any account whatsoever those that are private property the Genl. will endeavor to git them paid by the State - (21)

Unfortunately the other scanty references of the time exhibit pretty much the spirit of an unidentified British soldier who described Fort Moultrie in 1780 as -

...the strongest Fort ever built by Hands. No labor has been spared to complete it. You can have no Idea of its strength without being Inside it; therefore it would be needless for me to describe it. (22)

The following are chronologically arranged contemporary descriptions of the Fort and other related Charleston fortifications:

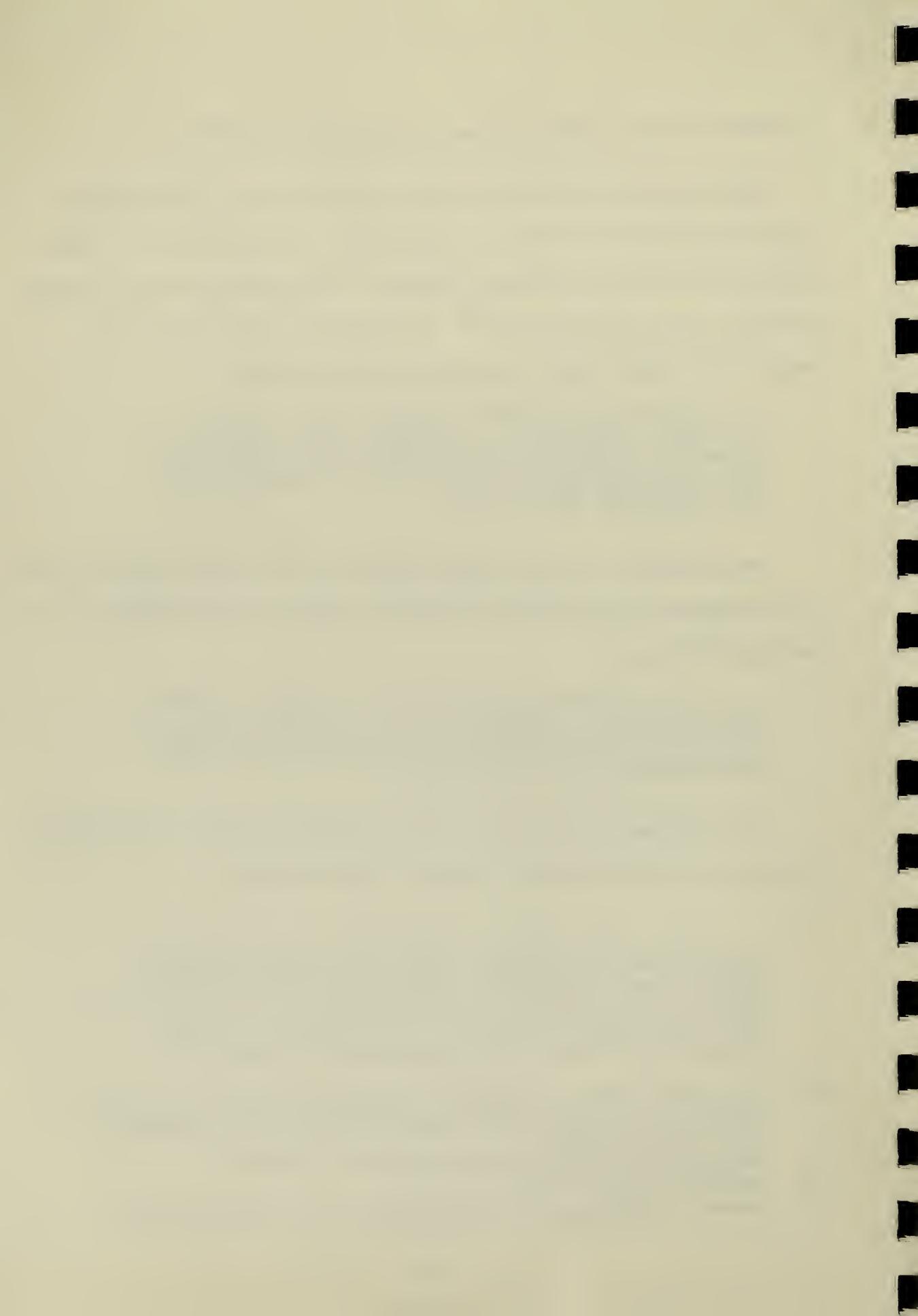
1. 1777-...Fort Johnson, a regular Square...On the second Island is the fort formerly named Sulivan [sic] and today [called] Fort Moultry [sic]...This fort is also a regular square...By forced labor they made this fort more respectable (for at the time of the attack [1776] only one side was finished); they made it more impregnable by raising the

19. Lee Kennett, edit. and trans., "Charleston in 1778: A French Intelligence Report." The South Carolina Historical Magazine, 109-110 (April 1965).

20. Bearss, The First two Fort Moultries, p. 4 and p. 6

21. Pinckney, Dec. 29, 1777

22. Bearss, The First two Fort Moultries, (underlining supplied)



height to twenty feet...In these fortifications they use only palm tree wood to form the exterior; and sand or earth to fill up the inside...These forts...are without moats and outside works, easy to scale, even without ladders [for] the trees can be easily grasped by hands and feet...

The town of Charles-Town...is defended by...Batteries ...all constructed like the forts [mentioned] above.(23)

2. 1778 - ...ships entering the port are obliged to pass under the cannon of a sizeable fort situated to the north, named Fort Moutry [Moultrie], in which there is a double battery...It is constructed with palm wood which is much better for this purpose than the best masonry in that being spongy the balls cannot pierce it but remain imbedded, thus only adding to its strength. It was only through the embrasures that the English [in 1776] effected the little damage which they did...the gallery where the upper battery is situated is of plank and quite wide...In this fort there is a garrison of four hundred men...Fort Johnson which also has a double battery...It is also in very good condition, built similarly to Fort Moutry [sic] but smaller...<sup>(24)</sup>

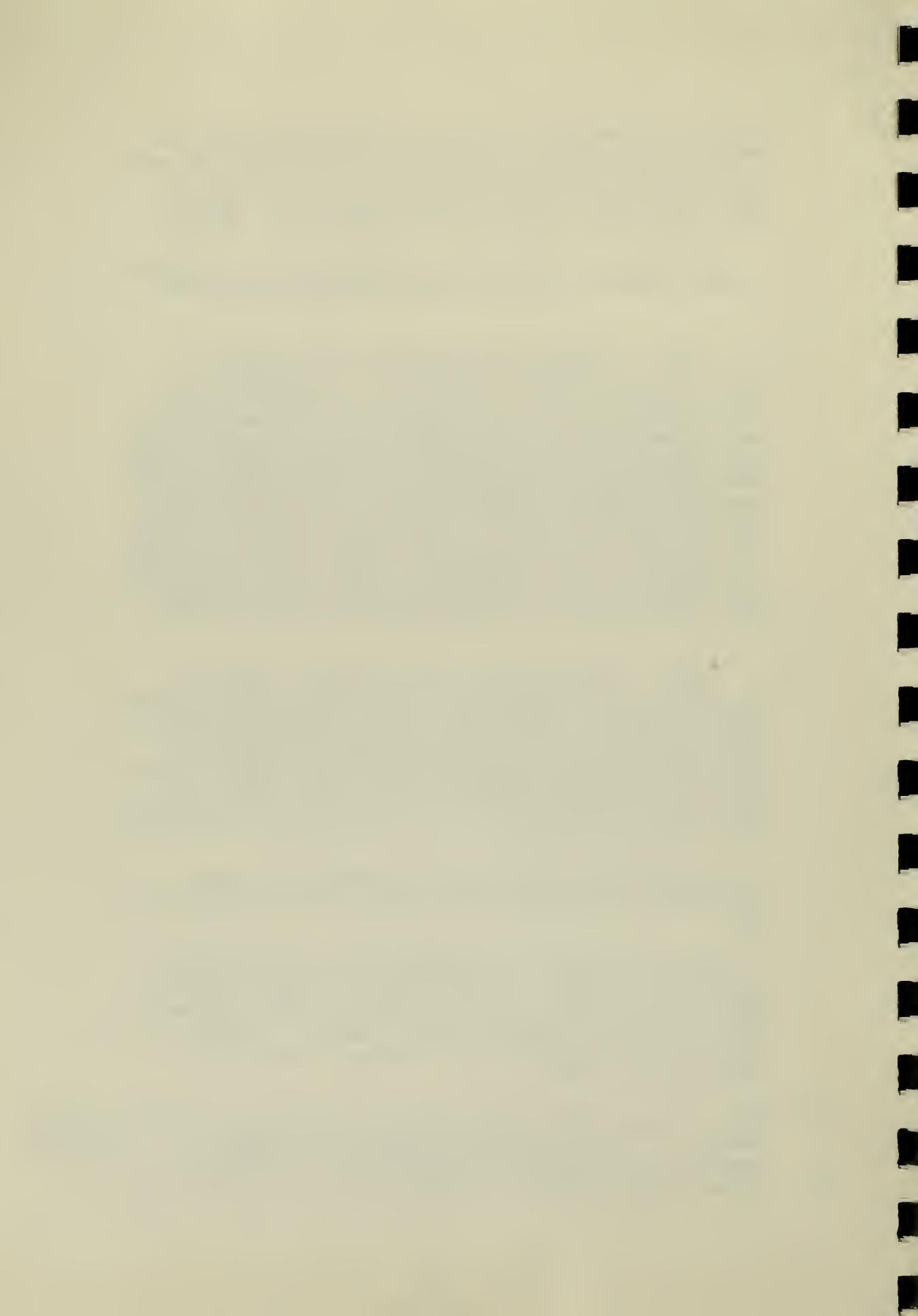
3. 1780 - ...[the defenses at Charleston]...The part called the royal [crown] work is faced with bricks or with a wall of oyster shells [tabby], while the breastworks, which are eighteen feet thick, are made of coffers of whole cabbage trees, the wood of which is as tough as cork. these are filled with impounded sand...[the work at the point of the "Neck"]...built in terraces, also of palmetto logs and oyster shells...

Fort Johnson, which was demolished by the enemy themselves, was quadrilateral, built of bricks and palmetto logs.

Fort Moultrie...is constructed like the usual fortifications of a harbor 'en amphitheatre'. The material is brick and palmetto, a pliable, very strong and tough wood, which yields to an impact without breaking. The fort has a garrison of one hundred and fifty men commanded by Colonel Scott...<sup>(25)</sup>

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23. Paul G. Sifton, "Some French Sources of South Carolina Revolutionary History,..." The South Carolina Historical Magazine, 107 (Ap. 1965)  
24. Bearss, The First two Fort Moultries, p. 17 (Underlining supplied)  
25. "Diary of Capt. Ewald," The Siege of Chastn, pp. 95, 199



4. 1780 - The Entrenchments of Charlestown were formed by Redans and broken Curtains. The parapets were 7 ft. high, 15 ft. thick. The ditch 12 ft. deep and 20 feet in width. It was double pallisaded with 3 rows of holes and a Strong Abbatis [sic],...the Entrenchment [sic] were made in haste in less than 4 weeks. (26)

Although the foregoing documentary data, including that contained in Mr. Bearss' report on the first two Fort Moultries, is generally enlightening it is not sufficient for the purpose of designing a reconstruction.

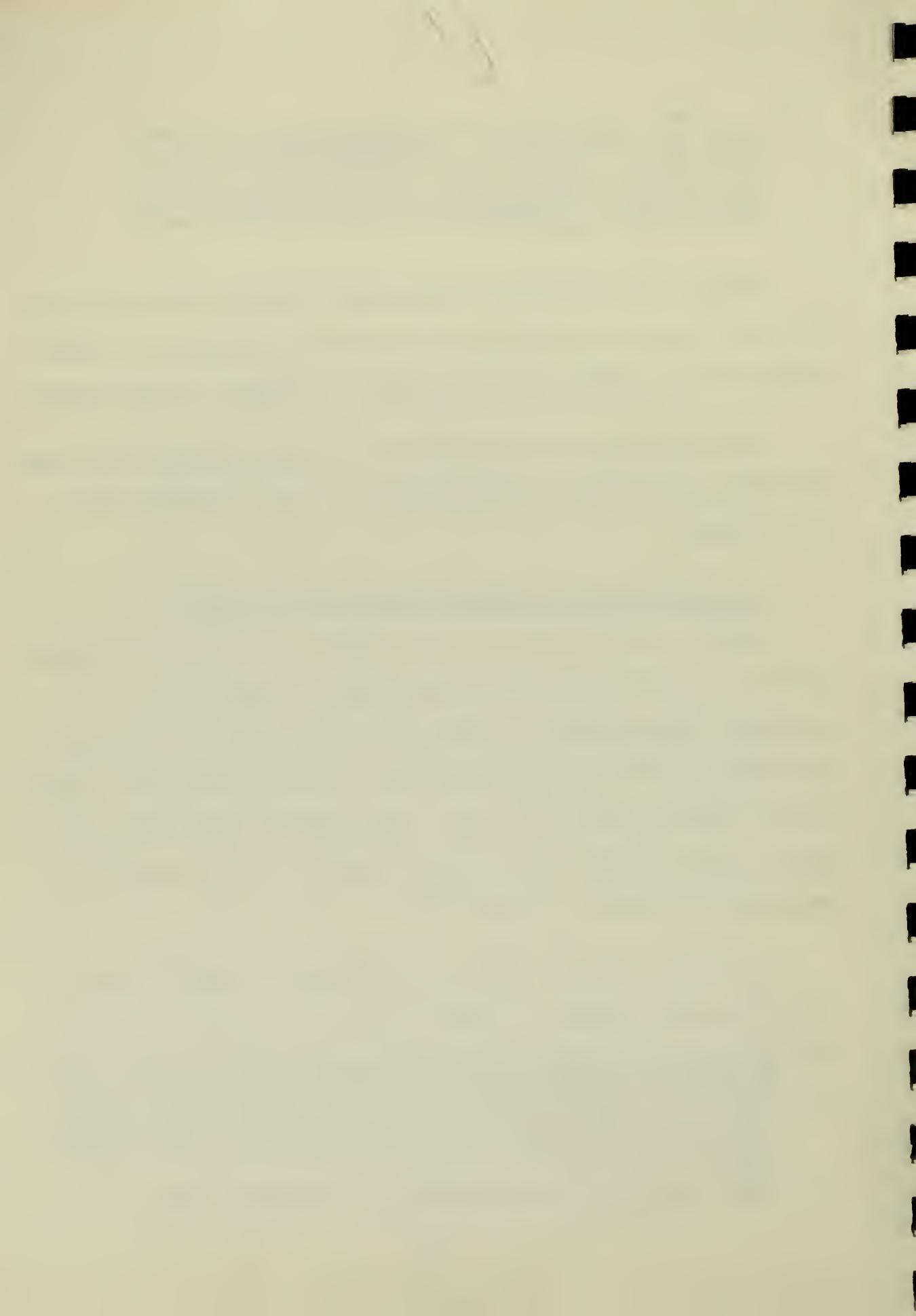
It was hoped that the archeological excavation this fall would locate substantive architectural features, however, at this time such has not been the case.

### 3. LOCATION AND ARCHITECTURAL DETAIL OF FORT MOULTRIE II

The site of Fort Moultrie II can be plotted with reasonable accuracy. In 1796, J. Purcell, District Surveyor, drew up "A plat of part of Sullivan's Island showing the land laid out and reserved for the use of Fort Moultrie." (27) Shown on this plat was the unfinished masonry foundations of "the new Fort Lately laid." This foundation was for the south front of Fort Moultrie II which was begun August 4, 1796 and abandoned unfinished by the end of the year. (28)

In the late spring of 1798 the work abandoned in 1794 was resumed. The work had been stopped as it was larger than the appropriation would

26. The Plan of Charlestown with its Entrenchments and those made during the Siege by the English in 1780. Charleston Historical Society.  
27. Purcell, J., "A plat of part of Sullivan's Island showing the land laid out and reserved for the use of Fort Moultrie. From a Survey taken under the direction of His Excellency the Governor in August, 1796."  
28. Bearss, The First two Fort Moultries, p. 42 and pp. 47-48



support hence upon its resumption in 1798 it was reduced by half. The new work utilized the west half of the 1794 foundations and by November 1798 the fort was completed.<sup>(29)</sup> Macomb's plan of 1806 locates the fort with respect to the barracks and bake house, the reservation boundaries, the canal, and a sketch outline of the proposed location of Fort Moultrie III.<sup>(30)</sup> Diamond's plan of 1807, locates the fort in relation to the old barracks, the reservation boundaries, the streets, the canal and the Cove;<sup>(31)</sup> and Mansfield's 1830 plan noted the remains of the fort in relation to Fort Moultrie III.<sup>(32)</sup> The only other known contemporary drawing of Fort Moultrie II is the detailed plan of ca. 1803. This drawing, however, omits any boundary reference points with the exception of the front beach line which is shown as encroaching on the ditch of the fort.<sup>(33)</sup>

In 1833, Captain Eliason, U. S. Engineers Office, Charleston, submitted to the Chief Engineer a very detailed plat of Sullivan's Island in the vicinity of Fort Moultrie. The purpose of the drawing was to respond to an official order to furnish an accurate plan relating the existing 1833 fortifications to the old government reservation.<sup>(34)</sup>

This drawing which contains an outline of Fort Moultrie III in relation to the Fort Moultrie II reservation, the Canal and the street system and plats of private property north and 1200 feet west of the fort, has proven

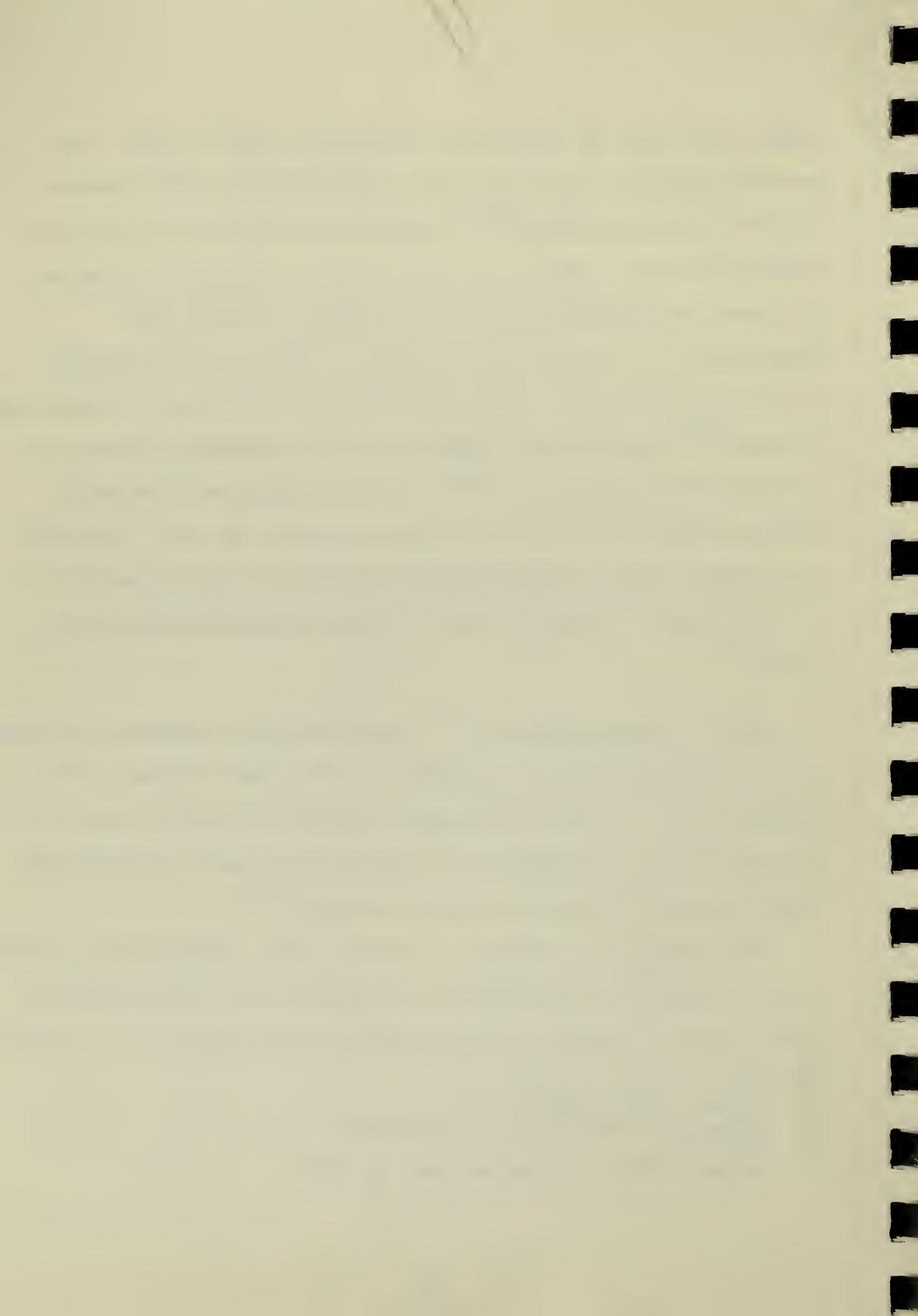
29. Bearss, Ibid., pp. 62-63

30. Bearss, Ibid., Plate VI

31. Bearss, Fort Moultrie No. 3, Plate VIII

33. See plate

34. Bearss, Verbal conversation (Oct. 30, 1973)



to be very accurate. Overlaid on a 1966 aerial photograph, the basic land data correlates very closely to existing conditions.

Eliason's 1833 drawing, when combined with Mansfield's 1830 plan, Diamond's 1807 map, Macomb's 1806 plan, the ca. 1803 plan, and Purcell's 1796 plat, locates Fort Moultrie II immediately south of Fort Moultrie III, just as Mr. Bearss had concluded. (35)

Other data referring to brick work is furnished by "Dr. Ravenel's Views of Preservation of Fort Moultrie" written in the fall of 1837:

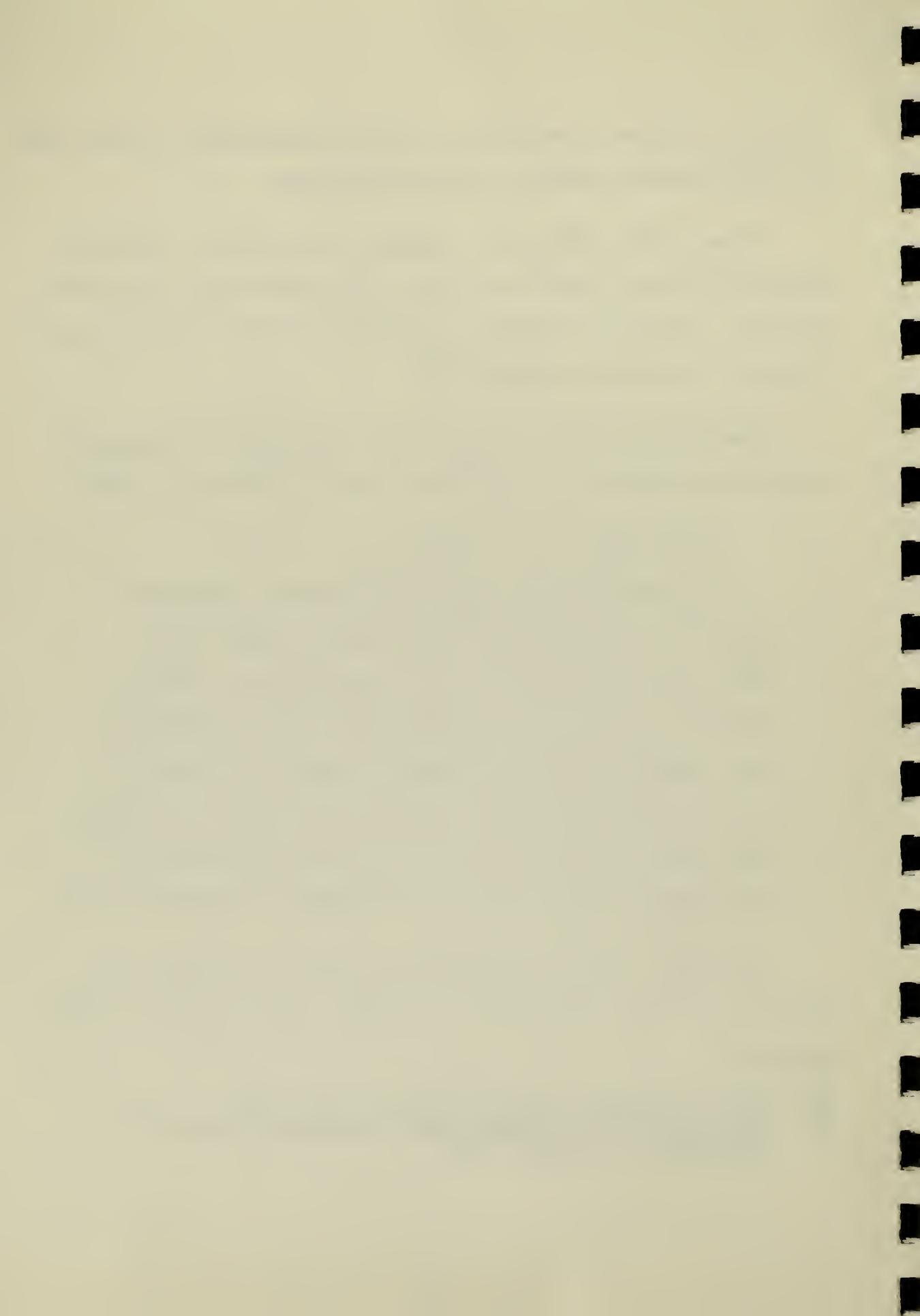
Preservation of Fort Moultrie -

At the time of the Battle of Fort Moultrie, High Water Mark was at least 150 yards farther from the present Fort, [Fort Moultrie III] than it now is - the Breakwater recently erected occupies the spot which was the centre of the Palmetto Fort. This was determined by Captain Baker's recognizing the Well & the Brick walls which supported the Steps to the Parapet - these were in the Curtain drawn across the unfinished Fort, & were exposed by the encroachment of the Tide a few years ago. (36)

Although Dr. Ravenel interpreted the ruins to be those of Fort Moultrie I, from the description they appear to have been those of Fort Moultrie II.

35. Bearss, The First two Fort Moultries, Plate VIII

36. Ellis, Detreville, Nathaniel Lebby, Patriot and Some of His Descendents, pp. 297-300: 1967



The initial interpretations of Bowman's report of finding old brick foundations was that they belonged to Fort Moultrie II since Fort Moultrie I was a palmetto fort and therefore had no brick foundation. Several references, as well as engineering logic, seem to refute this argument.

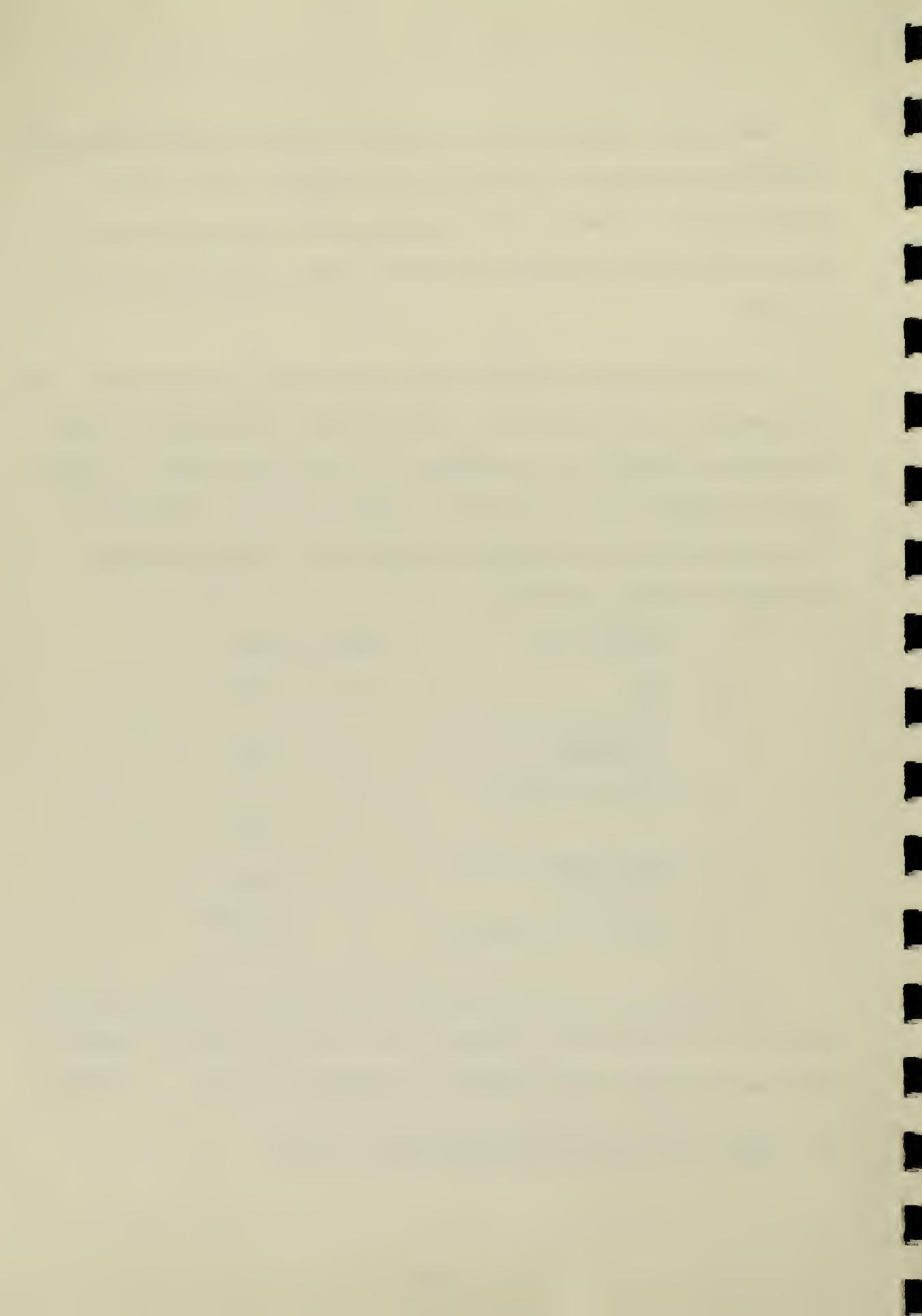
The first argument is based on an architectural interpretation of the construction of Fort Moultrie II. From Purcell's 1796 plat it is clear that masonry foundations approximately 15 feet wide were laid. A review of the expenditures for construction materials however, indicates that Fort Moultrie II was essentially a palmetto fort. The construction materials and their costs were:

1. Palmetto logs	approx.	\$5,000
2. Lime	"	800
3. Transportation of materials	"	500
4. "flates" [slates]	"	600
5. Axes, spades, picks & hatchets	"	230
6. Provisions & Sundries	"	1,300 <sup>(37)</sup>

Interpretation of the 1803 plan of Fort Moultrie II further indicates that this must have been a palmetto fort. The only brick walls shown on the plan are those of the bomb-proof or "Caserne", a narrow, rectangular

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37. Bearss, The First two Fort Moultries, pp 64-65



structure across the rear or north curtain, and the rampart walls enclosing "The place of Arms."

These rampart walls are shown supporting the steps leading up from the place of arms to the terreplein and apparently are the walls previously described as observed by Dr. Ravenel: "the Brick walls which supported the Steps to the Parapet."

From this analysis it appears that Fort Moultrie II was essentially a palmetto fort erected on a brick foundation.

The second argument for such construction is found in Mr. Bearss' report. In the middle of June 1776 when it became apparent that there would be an engagement with the British, "Captain Ferdinand DeBraham, [sic] a military engineer, was rushed over to Sullivan's Island to oversee the construction of some breastworks adjacent to the fort and at the 'Advance Guard'."(38)

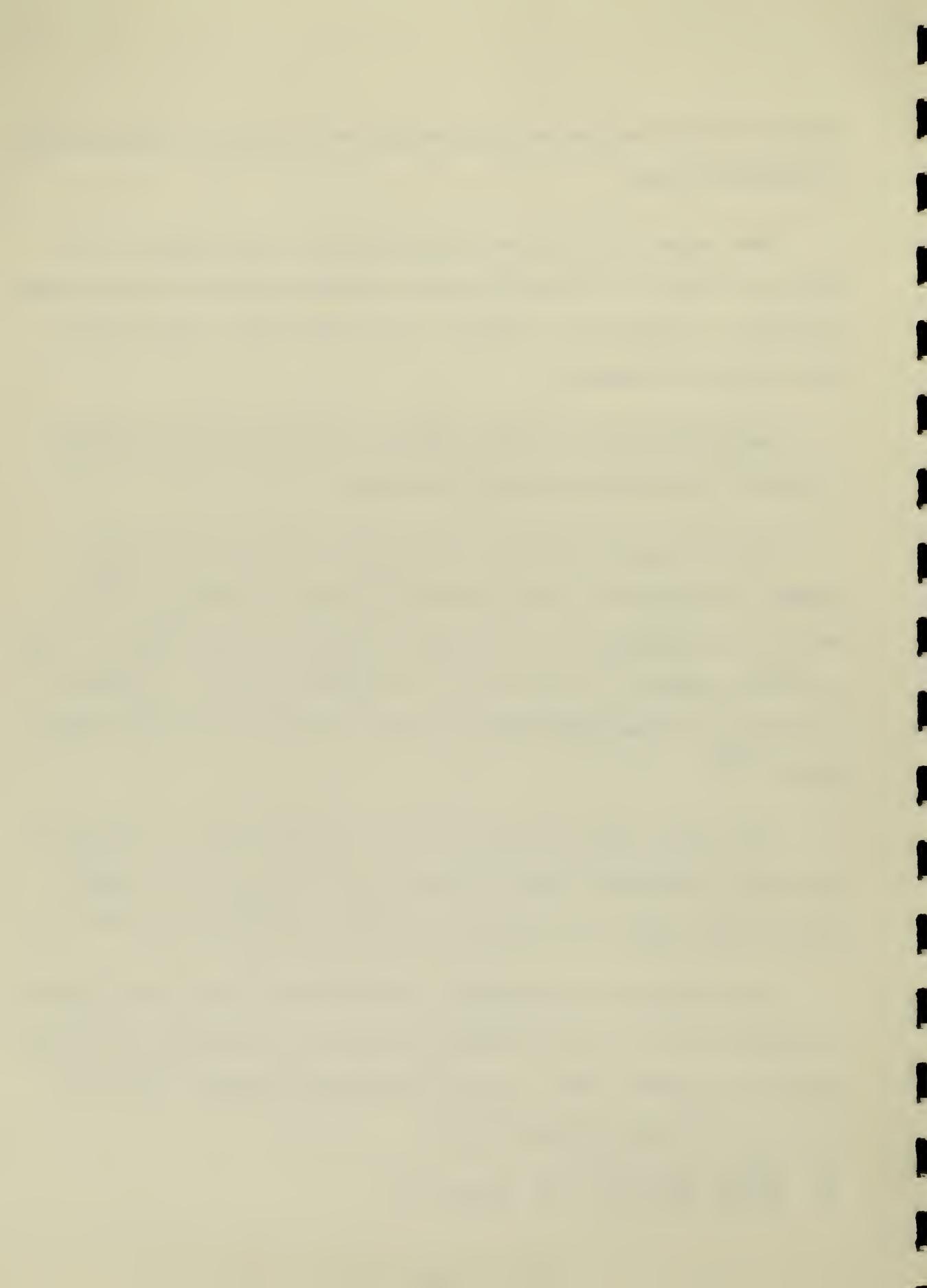
"The 'Advance Guard' was constructed of palmetto logs, with merlons, on a brick foundation. The brick foundations were seen by Dr. Johnson shortly before 1850, when they were uncovered by shifting sand."(39)

It is reasonable to assume that if the "Advance Guard" was a palmetto breastwork erected on brick foundations, similar constructions by the same Engineer at the same time, i.e., the "breastworks adjacent to the fort" would also be palmetto logs on brick.

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38. Bearss, Ibid. p. 6

39. Bearss, Ibid., pp. 7-8, footnote 11



The third and concluding argument is based on good engineering construction practice. Placement of logs directly on the surface of sandy ground does not provide sufficient stability for a work of any size. In a beach area subject to shifting sands and the occasional encroachment of storm tides no military engineer would erect a fortification without some form of sub-surface foundation.

The conjectural appearance of Fort Moultrie II is based on an interpretation of the previously described period maps and plans. No known elevations of the fort exist.

The following archival drawings, found in the National Archives, are the most significant and informative with respect to the first two Fort Moultries:

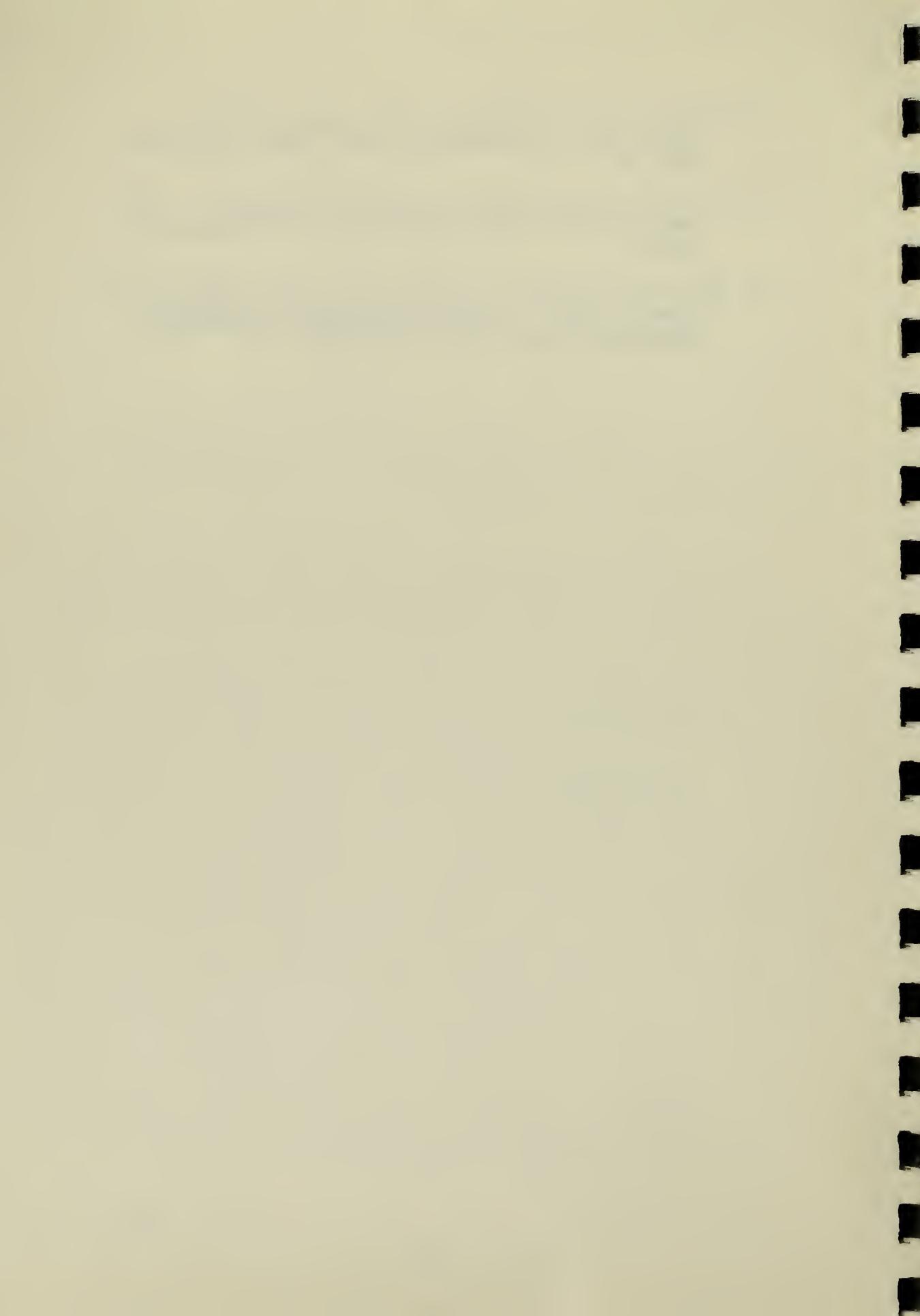
- 1) "Map of the Clinton Collection, 302, Charleston, the British attack of 1776"
- 2) "A N.b.E. View of the Fort on the Western end of Sullivans [sic] Island..." ca. June 1776
- 3) "A N.b.E. View of the Fort on the Western end of Sullivans [sic] Island..." August 10, 1776
- 4) "A Plan of The Attack of Fort Sullivan...from the Drawings made on the Spot...", August 10, 1776
- 5) "A Plan of the Attack of Fort Sullivan...By an Officer on the Spot...", September 7, 1776
- 6) "A Plat of part of Sullivan's Island..." J. Purcell, August 1796
- 7) "Sullivans [sic] Island..." N.D. ca. 1783-1796
- 8) "Plan of Fort-Moultrie on Sullivan's Island, South Carolina." RG77, Drawer 65, Sheet 2



9) "The plan of four Sites for the erection of Forts...  
August 1807 by John Diamond, Surv." RG77, Drawer 64,  
Sheet 19

10) "A Plan of the Harbor of Charleston, Surveyed by...Alex  
Macomb, Capt. of Engineers, 1806." RG 77, Drawer I,  
Sheet 2

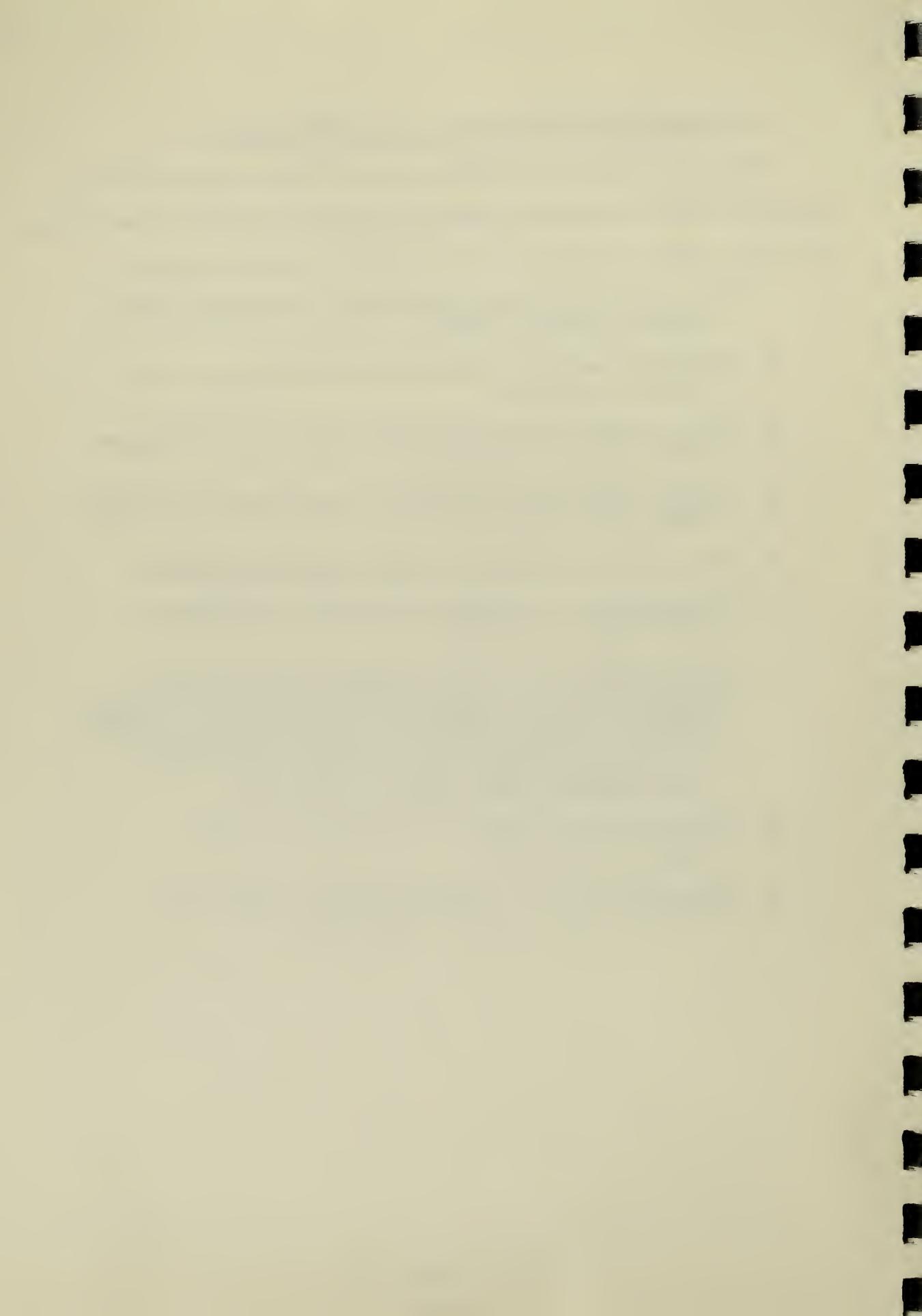
11) Plan of Fort Moultrie and Map of the Battle of Sullivan's  
Island, taken from Drayton, Memoirs of the American  
Revolution, Vol. 2, Charleston, 1821



## B. SUMMARY OF DOCUMENTARY DATA - FORT MOULTRIE III

The following archival drawings, found in Record Group 77 in the National Archives, have been selected as the most significant and informative with respect to Fort Moultrie III and its internal changes:

- 1) "Plan of Fort Moultrie" prepared by Lt. Mansfield in 1830, Drawer 65, Sheets 6 and 8
- 2) "Plans and Sections of Magazine at Fort Moultrie, 1839," Drawer 65, Sheet 12
- 3) "Plan of Fort Moultrie, Charleston Harbor, S. C.," October 1840, Drawer 65, Sheet 14
- 4) "Sketch of West End of Sullivan's Island, Charleston Harbor," 1865, Drawer 64, Sheet 75
- 5) "Fort Moultrie, January 30, 1868," Drawer 65, Sheet 19
- 6) "Fort Moultrie, as proposed by The Board of Engineers, 1871" Drawer 65, Sketch B
- 7) "Fort Moultrie, S. C., Plan, Sections, and Elevations, Showing the original design for Reconstructing the Work, December 1871, with modifications since adopted, including the re-arrangement of B. H. Walls and Front Ends of Traverses in accordance with circular of May 7, 1874," dated January 18, 1877, Drawer 65, Sheet 25
- 8) "Magazine in N. W. Corner of Fort Moultrie," 1877, Drawer 65, Sheet 31-2
- 9) "Fort Moultrie, S. C., showing Batteries Bingham and McCorkle," 1898, Drawer 65, Sheet 30-1



C. SUMMARY OF EXISTING CONDITIONS - FORT MOULTRIE III  
(See Appendix for photographs and drawings)

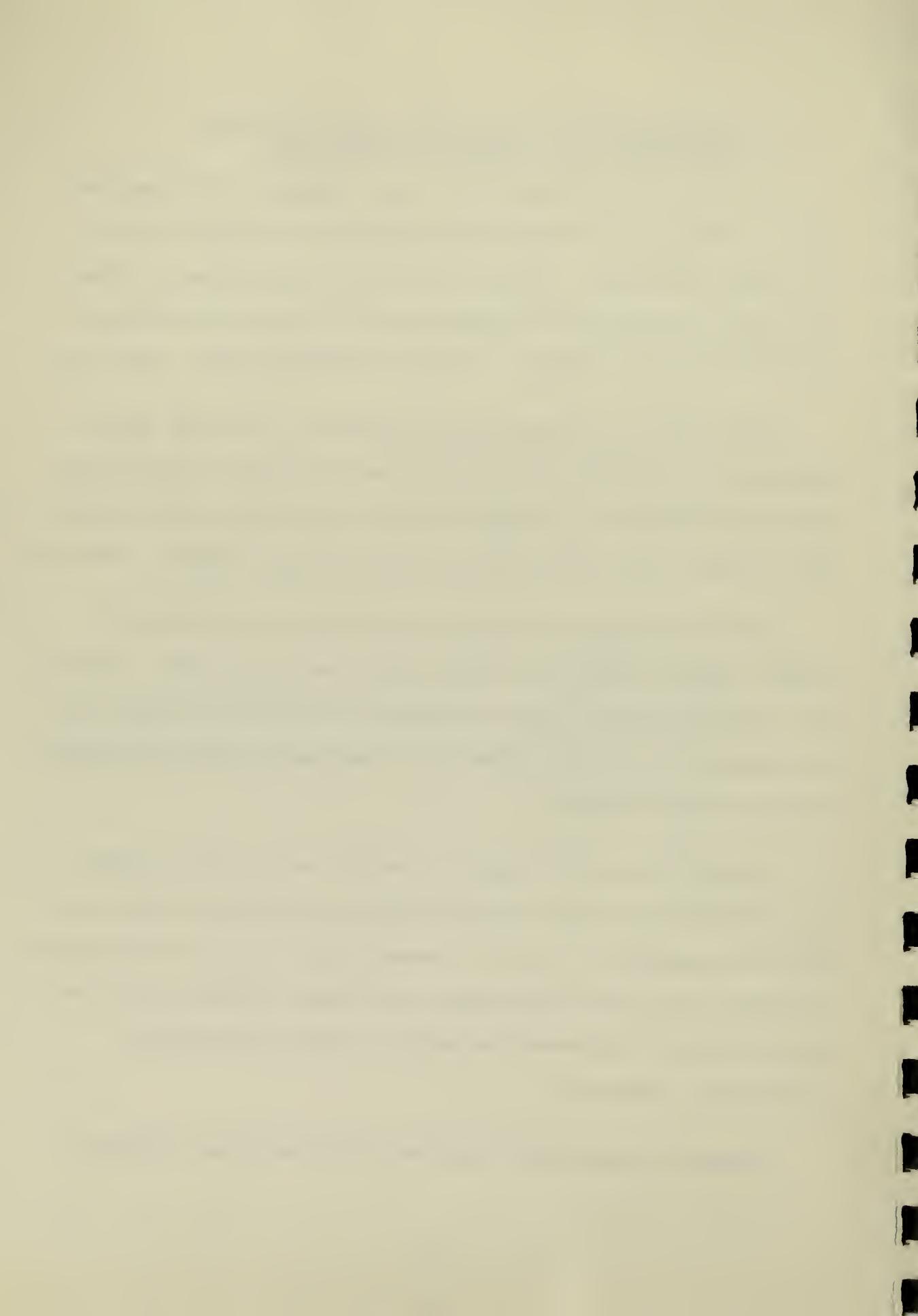
The present fort, including all of its components, is in good condition. (Photo 1) The brick are hard burned units and very few have noticeably deteriorated. The northeast angle of the southeast salient has separated from the wall and needs repair but there are no serious structural faults to be found in any of the historic fabric. (Photo 2)

Mortar joints on the respective north faces of the gorge and the northeast and northwest bastions are in poor condition. In many places the mortar has eroded to the point that face brick can be pried from the wall. Joints on the other walls are in fair to good condition. (Photo 3)

All of the underground magazines and galleries on the interior require cosmetic patching of concrete floors and stucco walls. (Photo 4) The exterior surfaces of these structures are concrete under earth cover and although there is some evidence of ground-water leakage and faulting, they are in good condition.

The brick and granite aggregate concrete roofs of the Sally Port have suffered deterioration of the surfaces, leaving them rough and exposing the aggregate. (Photo 5) Wherever any of the other underground structures' roofs have been exposed to the weather through loss of the super-incumbent earth cover, the concrete surface has eroded and deteriorated. (Photo 6)

Leakage of surface water into the underground rooms and galleries



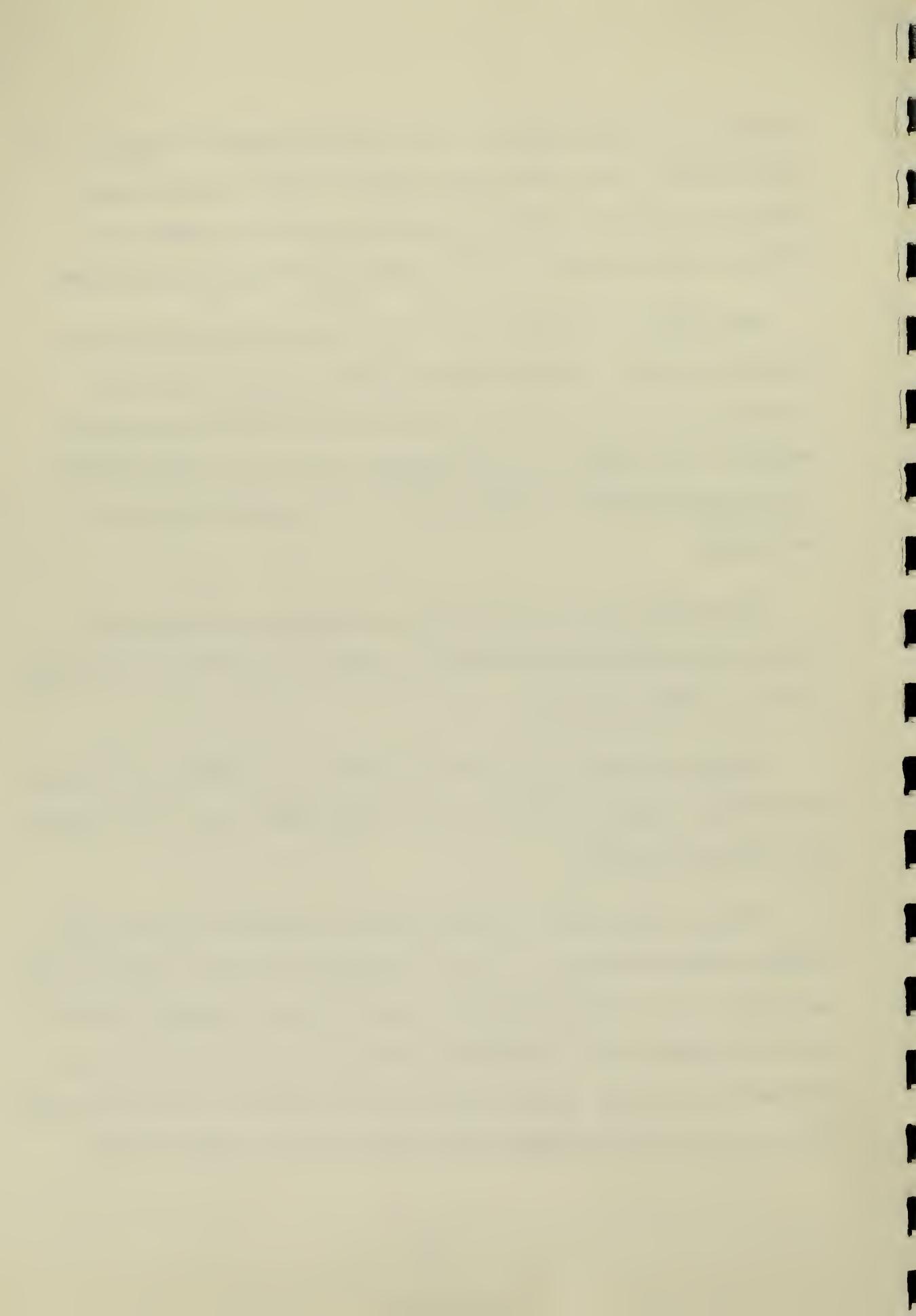
through roof or wall surfaces, is not a serious problem at present. In several places, notably the exposed roofs of the East and West Bomb-proofs, old asphaltic coatings are evident and it may be that such membranes are responsible for the present general lack of water access.

The problem of leakage was serious in the Sally Port and its two flanking casemates until the spring of 1973. At that time a waterproofing contract was carried out and the work, consisting of sealing the large cracks with polysulfide polymer sealant and applying Hydrozoo to the exposed concrete surfaces, appears to have alleviated most of the problem.

Discoloration of the walls in the west bombproof indicates some water access through the walls but the seepage has not been of such magnitude as to spall the plaster.

Although the water table is very shallow at Fort Moultrie, there are no observable signs of capillary rise (rising damp) in any of the masonry or concrete structures.

The most serious water problem is that of rainwater access to the several service magazines. At times of hard rains the water rises as much as a foot or so in these underground rooms and must be pumped out by the park maintenance staff. The problem appears to be the result of later changes and additions to grade levels at the entrances to these structures, which in all cases are higher than called for on the original plans.



(Photo 7) This results in a funnelling of rainwater into the entrances.

Condensation does not appear to be a significant problem with the possible exception of the old Storage Magazine in the Northwest Bastion. Although condensation occurs here under certain conditions, it appears that this was never a major problem in the structure's historical period and that restoration of the building can eliminate the problem.

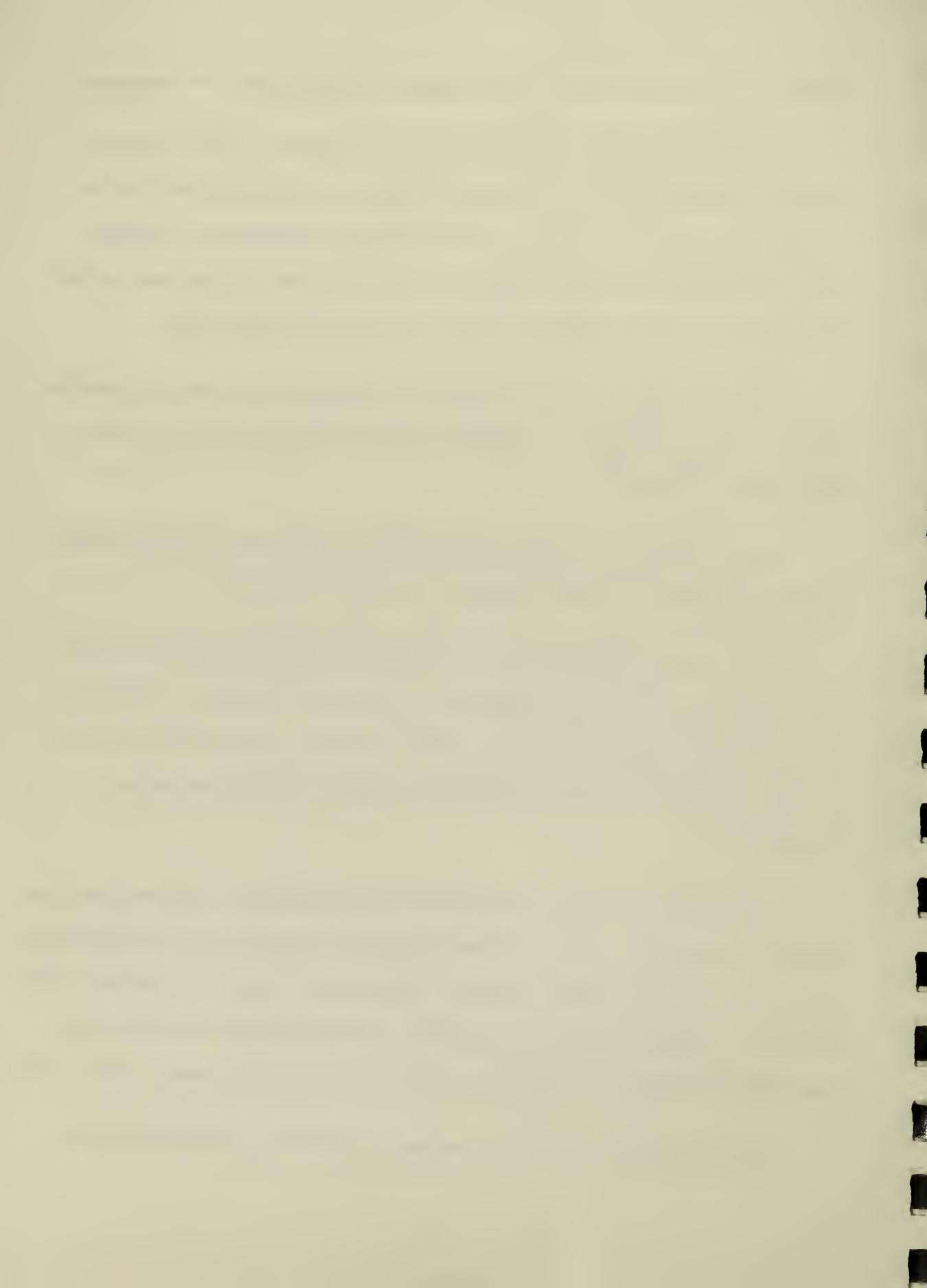
Ironwork present in the overhead of the Anteroom of the old Magazine has exfoliated resulting in spalling of the concrete surfaces of beams and ceiling. (Photo 8)

Some exfoliation is present also in the steel beams and reinforcing at the entrance to the East Magazine of Battery McCorkle.

Of the three Endicott Batteries (Battery Bingham, Battery McCorkle and Battery Lord), Battery Bingham is in the best condition. (Photo 9) All of the exposed steel and iron work is in very good condition, well painted and smooth surfaced, showing few signs of corrosive action. (Photo 10)

The concrete of this battery is in good condition. The surfaces are generally sound and smooth, although broken by numerous but insignificant hairline cracks and exhibiting minor surface spalling. The concrete blast apron is in fair condition. There has been subsidence and cracking and the entire surface has eroded, exposing the granite aggregate. (Photo 11)

The same surface erosion is evident in both the concrete emplace-



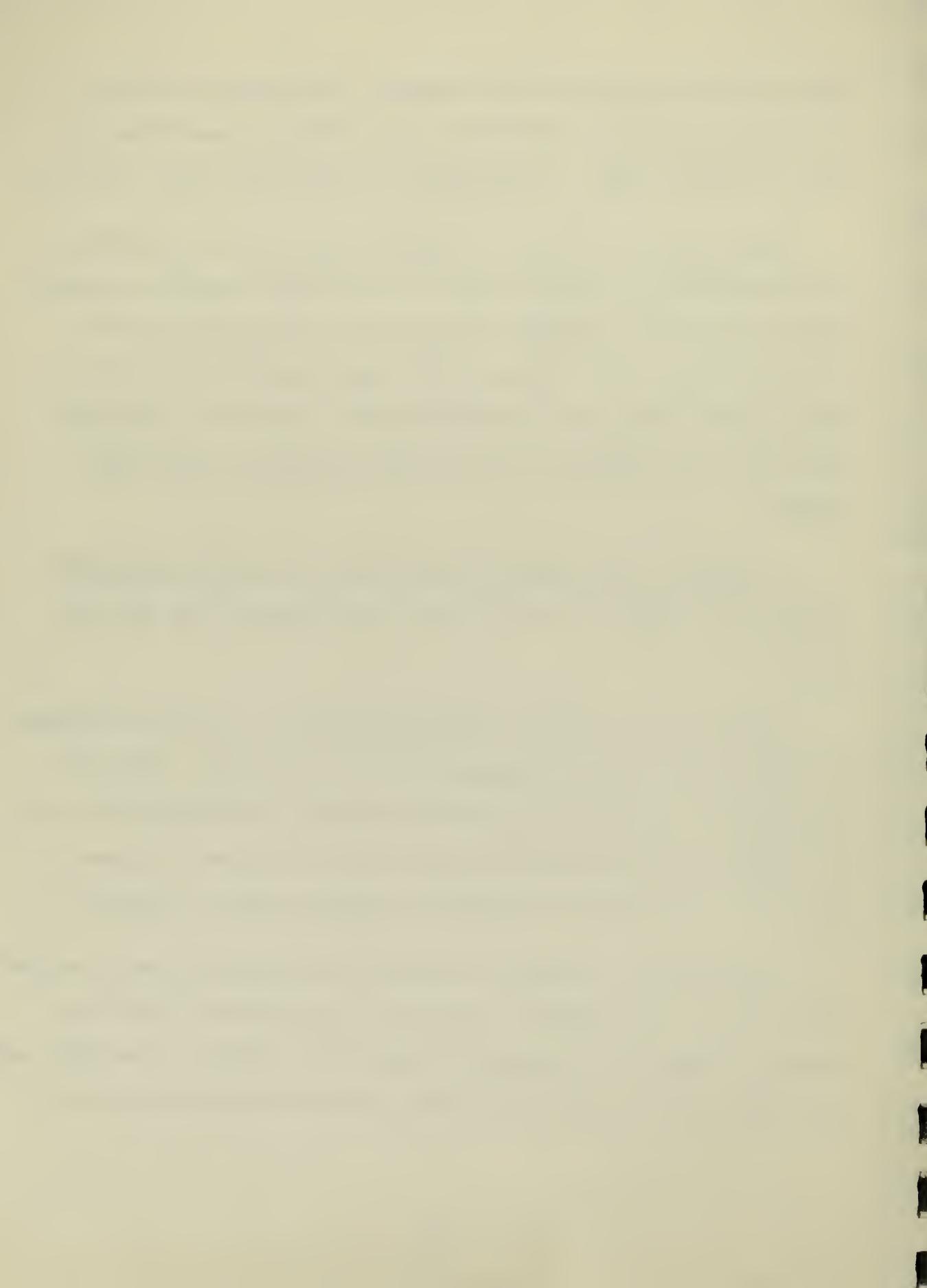
ment and the blast apron of Battery McCorkle. The apron here, however, is in better structural condition with less faulting and subsidence than that of Battery Bingham. The emplacement is structurally sound. (Photo 12)

Battery Lord is in the worst condition. (Photo 13) The concrete of the emplacement has numerous fissures on the horizontal surfaces, allowing water access which has opened the cold joints of the vertical surfaces of the north face. Here, water exiting through cracks has resulted in lime (calcium) formations on the wall surfaces. (Photo 14). The blast apron is in fair condition with some surfaces spalling and subsidence evident.

In addition to the three Endicott Batteries, the other existing gun positions are numbers 1, 9, 10, 11 and 12, all erected in the 1872-1876 period.

Gun position 1, located in the Northeast Bastion, is the most complete and in the best condition although the timbers are decayed. (Photo 15) Gun position 12, located in the Northwest Bastion, is in good condition but it consists only of the granite platform and steel pintle. The breast-height wall exists only as unstabilized foundation ruins. (Photo 16)

Gun positions 9, 10 and 11, located on the southwest or Sumter seafront, are in fair to poor condition. (Photo 17) Gun positions 9 and 11 are buried and only traces above ground indicate their position. The timber and iron work of 10 is readily evident and is in fair condition although the



timbers are decayed. (Photo 18)

The Harbor Entrance Control Post/Harbor Defense Command Post is in excellent condition. (Photo 19)

Over the years the sodded slopes of the numerous earth mounds protecting the underground structures have eroded somewhat, resulting in a softening of the original contours. All are well-grassed, however, and stable at present. (Photo 20)

Doors and windows in the various structures are in good condition. Several of the Service Magazine wood doors have begun to decay on the bottom and the exterior steel doors of the ground-level entrance of the HECP/HDCP have small holes caused by corrosion but in general they are in good condition.

Drainage of the area is poor, resulting in flooding of underground spaces as cited above and in standing water immediately in front of the north curtain wall (Gorge). Storm drains back up in times of abnormally high tides and cause flooding, principally in the Sally Port.



## D. SUMMARY OF RESULTS OF PHYSICAL INVESTIGATION OF STRUCTURAL FABRIC

### 1808 Construction:

#### 1. Enceinte

The only visible remains of the original enceinte of Fort Moultrie are the scarp walls. (The parapet or coverline walls, parade walls, counter-forts and tie walls were removed in 1872.) Foundations of the walls, 7'6" wide, were erected on a double layer of thick plank which, over the years, has decayed and allowed differential settlement. This settlement has produced wall cracks but repointing efforts dating back to the 1830's have held the damage to a minimum. At present bond separation is evident but in every case the soft lime mortar has allowed for slight movement without damage to the brick units. (Photo 21)

The original mortar was composed of white lime with finely ground oyster shell-aggregate. Because of the softness of this mortar, periodic repointing of the walls has been necessary. (Photo 22) Mortar from 1860 to the present has been a cement mortar with sand-aggregate. (Photo 4)

Mortar joints are generally good with the exception of the north faces which require extensive repacking of the joints and repointing. The scarp walls are otherwise in fair to good condition.

#### 2. Northwest Bastion Storage Magazine:

This structure, altered somewhat in 1876, is the only remaining vestige of the inner works of the 1808 construction. It is a brick structure laid up in lime-oyster shell mortar with a heavy barrel-vaulted



roof. (Photo 35)

There are no visible signs of cracks or other structural failures, nor of any water-related problems except for condensation which occurs at intermittent times. The magazine is presently unlined. (Photo 34)

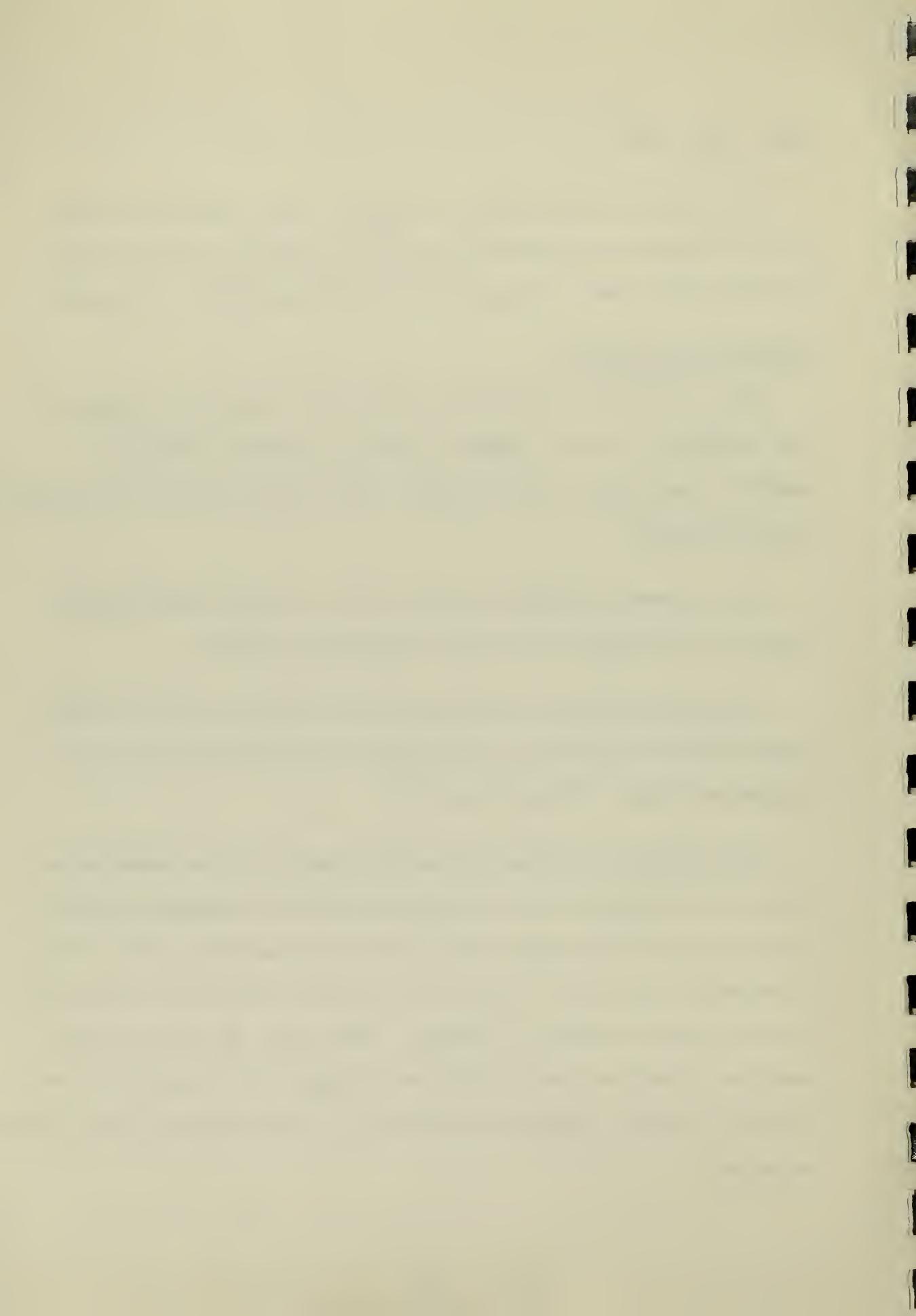
1872-1876 Construction:

The structures of this period consist of the Sally Port, East and West Bombproof, 5 service magazines, Principal Magazine, and inter-connecting galleries, and the gallery erected around the Northwest Bastion Storage Magazine.

All of these structures were built of low strength brick-aggregate concrete and in general are in good structural condition.

The only significant structural failures to be noted are the wing walls of Service Magazines 2 and 5 which have broken away because of foundation failure. (Photos 23 and 24)

The gallery surrounding the Northwest Bastion Storage Magazine was constructed by facing the old parade wall with brick-aggregate concrete and springing a brick vault across the old open passageway to the wall of the Magazine. (Photo 25) Both the concrete wall-facing and the mortar of the brick vault are very low strength. (Photo 26) The cement in both instances is very soft and can be easily chipped with a hand pick. The mortar of the vault separates cleanly from the brick surfaces, leaving them undamaged.



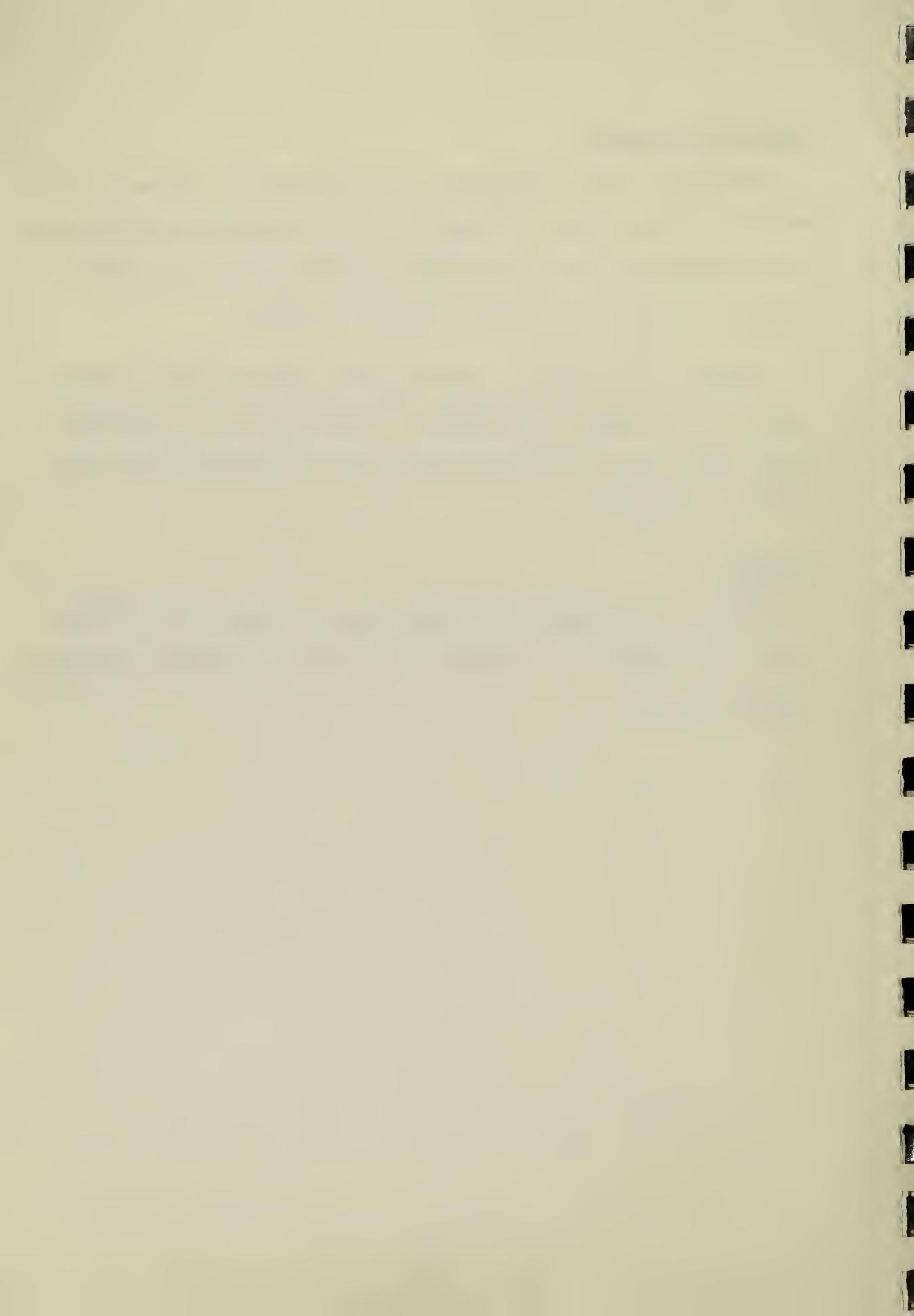
### 1898-1903 Construction

Structures erected during this period were Battery Bingham, Battery McCorkle and Battery Lord. These are all brick or granite-aggregate concrete structures and with the exception of Battery Lord, are in good structural condition. (Photos 9, 10, 11, 12 and 13)

Battery Lord, apparently constructed with numerous horizontal cold joints, is now somewhat deteriorated. Water access over the years has opened these joints and deposited heavy lime encrustations on the wall surfaces. (Photo 14)

### HECP/HDCP

The Portland cement HECP/HDCP structure is in excellent condition. There is no evidence of structural failure nor of water-related problems. (Photo 19 and 27).



## E. DESCRIPTION OF APPEARANCE DURING HISTORIC PERIODS

### 1. Summary of Physical Changes:

Fort Moultrie has undergone extensive changes in its 165 year existence. Erected in 1808 as the successor to two previous forts at this site, Fort Moultrie I (1776-1783) and Fort Moultrie II (1794-1804), Fort Moultrie was considered "...little inferior to any work in the U. States in point of magnitum and importance..." (1) Little change occurred during its first two decades but by 1830, the Fort had deteriorated considerably and repairs and improvements were made over the next several years.

Additional repairs and improvements were made in the period 1839-1846 and again in the period 1855-1860.

The period of the Civil War (1860-1865) resulted in several permanent alterations to the fabric as well as significant changes due to the effect of bombardment.

In 1872 work was begun that materially altered the Fort. At the conclusion of this construction period in 1876 the only remaining vestige of the 1808 construction was the exterior of the enceinte or scarp walls and the old Storage Magazine in the Northwest Bastion.

From 1876 until 1898 with the advent of the Spanish-American War the fort remained basically unchanged. Batteries Bingham, McCorkle and Lord w

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(1) Bearss, Fort Moultrie, No. 3, Ft. Sumter National Monument, Sullivan's Island, South Carolina by Edwin C. Bearss, Division of History, Office of Archeology, Historic Preservation, December 30, 1968, U. S. Department of the Interior, National Park Service, p. 22



were erected between 1898 and 1903, eliminating some of the earlier 1872-1876 gun positions and Service Magazines.

A final major change occurred in 1943 when the Harbor Entrance Control Post/Harbor Defense Command Post (HECP/HDCP) was built.

As it stands today, Fort Moultrie is a composite representing the physical evolution of a seacoast fortification through the significant military historical periods of the nineteenth and twentieth centuries.

## 2. 1808 - 1860 Period

Following the destruction of Fort Moultrie II by the devastating hurricane of September 1804 only ruins described as "heaps of rubbish" remained of the fortification. Chief Engineer Jonathan Williams, who visited Sullivan's Island in April 1807 noted, however, that "...the barracks, in the rear and without the fort . . . might be put in good repair by restoring the interior wood part." Williams went on to state that a new fort was to be erected at this site and that its front would occupy the ground immediately to the rear of the ruins of Moultrie II.<sup>(2)</sup>

Stimulated by the Leopard-Chesapeake affair in June 1807, Congress voted funds at the end of the year for new fortifications to protect important harbors. One of the new forts was to be Fort Moultrie III.<sup>(3)</sup>

The plans for the new fort were apparently conceived by Captain

(2) Bearss, Fort Moultrie III, pp. 9-10

(3) Ibid., p. 17



Alexander Macomb. Williams had originally advocated a triple-tiered casemated work in his official report of April 23, 1807.<sup>(4)</sup> On May 14, 1807 Williams wrote to Macomb relating that he had authorized the Military Agent at Charleston to begin purchasing materials and that he hoped to forward plans and specifications for the first new Charleston work to be undertaken (Fort Pinckney) within a few days. The earliest extant plan for Fort Moultrie III, however, was drawn by Macomb in June 1808. Whether Williams had a hand in the design is not known but it appears that Macomb can be credited with the work.

The plan drawn by Macomb and dated "1808 June" served as the basis for the construction of Fort Moultrie.<sup>(5)</sup> Certain details do not seem to have been carried out, indicating that the plan was modified as construction progressed.

The plan prepared by Macomb proposed an enclosed work of irregular outline defended by bastions and batteries; presenting a battery of three sides on the seafront. Within the walls on the parade were to be six individual structures; three barracks, two officers' quarters and a storage magazine.

A ditch averaging 30 feet wide and six feet deep was shown encircling the fort and a water battery with emplacements for seven guns, was drawn adjoining the ditch in front of the southwest corner of the

(4) Ibid., p. 11

(5) See Plate



south seafront, Outside the ditch at the Sally Port was shown a canal which led north into the cove.

There are two items of interest on this drawing. One is the plan relationship of the barracks buildings which conform to those dating back to Moultrie II. Based on Williams' statement in April 1807 projecting the reuse of the old barracks, one must presume that Macomb was thus indicating this concept on his plan of 1808.<sup>(6)</sup> The other item of interest is the delineation of the canal in hard, straight lines, thereby indicating that at this date it was a constructed feature rather than a natural channel.<sup>(7)</sup>

Two later plans are more revealing regarding the state of construction of the fort. The first, drawn by Captain Poussin in 1821, follows Macomb's plan in the general outline and siting of the fort.<sup>(8)</sup> It differs in not indicating a surrounding ditch nor a water-battery. By comparison with the second later plan, (that by Lieutenant Mansfield dated 25 September 1830) it appears that Poussin's drawing is accurate in all details with the exception of the stylized rendering of the enceinte which does not depict the embrasures. Poussin's drawing does give a detail missing on Macomb's plan; sentry boxes located at the salient angles of the respective

(6) The earliest conceptualization for the plan of Fort Moultrie III appears to be found on a copy of Macomb's "Map of the Harbor of Charleston...", 1806. Fort Moultrie II is shown in an inset and someone has sketched a rough outline of Fort Moultrie III thereon. Interestingly enough the sketch incorporated the old barracks and shows an extension to the Canal. Plate.

(7) Similarly, the Canal is clearly depicted on Diamond's 1807 survey map and is referred to in the description written thereon as "...the public canal." Plate

(8) See Plate



northeast, southeast, southwest and northwest bastions. These constructions show as narrow passageways or defiles corresponding to the capital of the respective bastions ending in circular enclosures at the extreme point of the salient. Mansfield's 1830 drawing shows the defiles but rather than terminating in circular sentry boxes he shows the passages terminating in square ends which do not totally pierce the coping. Only a thorough investigation of the fabric by removal of brick and excavating earth fill would possibly reveal if the circular sentry boxes were part of the 1808 construction.

Poussin's drawing also delineates the correct plan of the barracks and officers' quarters as erected in 1808. Although Macomb's plan revealed that Williams' proposal to incorporate the old quarters of Moultrie II in the new work had been seriously contemplated, we know from Macomb's account that prior to the construction of Moultrie III he caused the old quarters to be razed and the materials salvaged. (9)

In addition to the circular sentry boxes and the omission of the embrasures, Poussin's plan differs from that of Mansfield's on only one other small matter, the slope of the coverline; whereas Poussin shows this to be horizontal, Mansfield shows a slope to the exterior. Other than this detail Poussin's sections through the enceinte do not differ from Mansfield's.

(9) Bearss, Fort Moultrie No. 3, p. 21



Mansfield's 1830 drawing of Fort Moultrie was made in response to an order from the Engineer Department of August 30, 1830 requesting a report on the present state of the fort which would serve as a guide to the thinking of the Board of Engineers who were contemplating "...the improvement of Fort Moultrie by additions to it or by building on the present walls so as to render the fort secure from escalade..." (10)

Along with his drawing Mansfield also submitted a lengthy "Memoir, explanatory of the Plan, Profiles, Sections, etc. of Fort Moultrie and Remarks and Probable cost..." (11) In his Memoir, Mansfield noted that the settlement of the scarp walls due to the rotting of the plank foundation had resulted in a separation of the scarp walls from the respective tie walls and embrasure cheeks, but otherwise that the Fort was in relatively good condition.

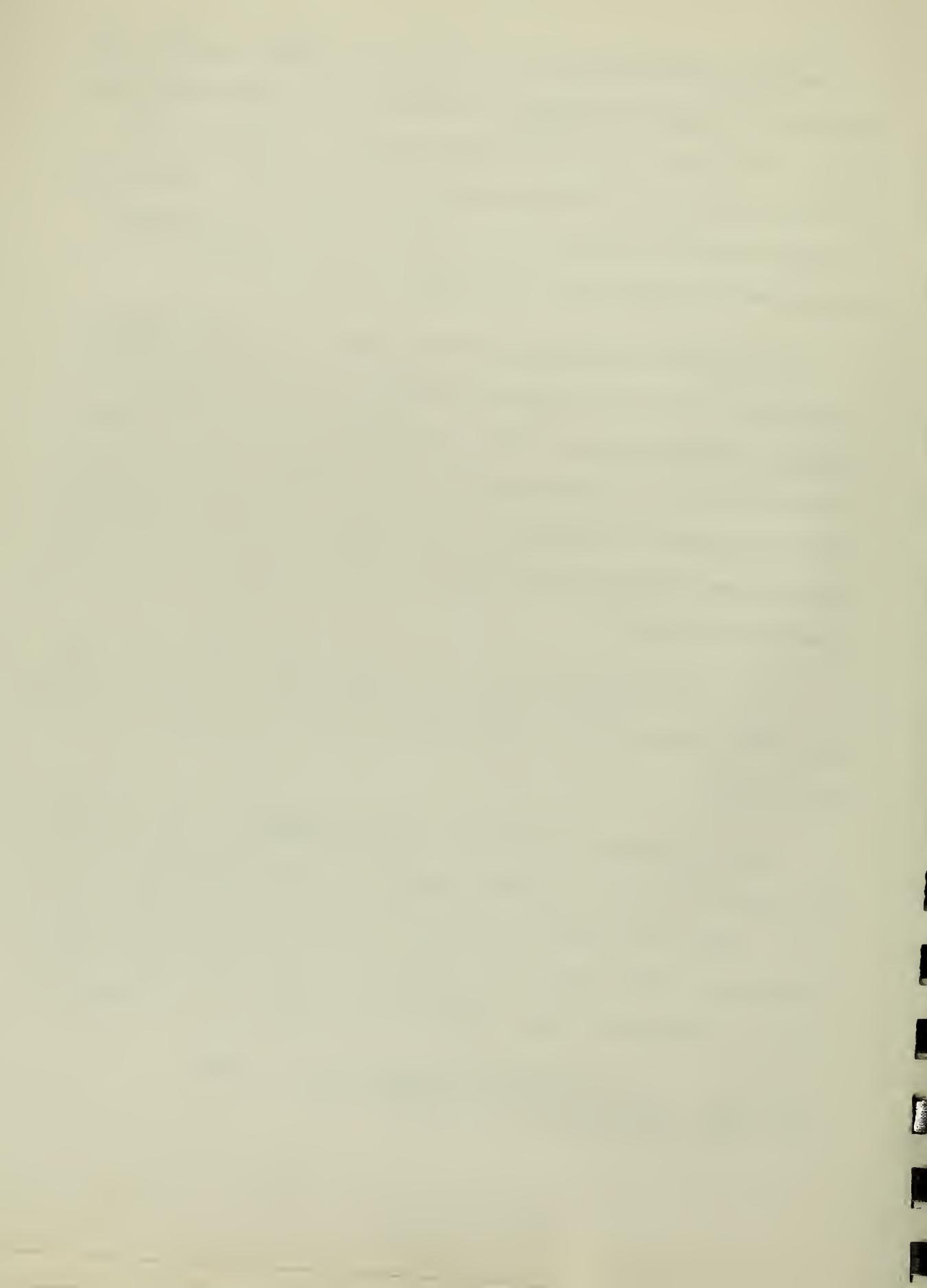
His greatest concern was for the "preservation of the site." The sea, which had previously claimed Moultrie I and II, was again threatening Moultrie III.

Following study of Mansfield's Plan and Memoir the Board of Engineers determined not to make any major change to the Fort's physical configuration. Rather, the period between 1830 and 1860 saw only repair and minor improvements made to the fort. Only four moderately significant changes were made during this time. Between 1830 and 1840, the 1808 embrasures

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10. Ibid., p. 69 and Mansfield's Memoir Sept. 25, 1830

11. Ibid., reproduced here in Appendix



of the land fronts appear to have been bricked in; in 1833 a line of pickets or "palisades 8 feet high..in advance of the three land fronts" was erected;<sup>(12)</sup> and in 1839 the 1808 wood ramps (which were rebuilt in 1833) to the seafront gun platforms and the Northeast Bastion were rebuilt  
<sup>(13)</sup> in brick. The fourth change was the erection of two hot shot furnaces. By 1830 the furnace shown on Poussin's 1827 plan was no longer in evidence. A new furnace was built by Captain Bowman in the repairs of 1840, but by 1855 this one had disappeared.<sup>(14)</sup> Captain Cullum noted in his letter of March 31, 1855 to General Totten that "A shot furnace can be built upon the parade of the work upon the site of the former one, which has been torn down. I know not for what reason."<sup>(15)</sup> Cullum rebuilt the furnace, completing it in February 1856.<sup>(16)</sup>

The appearance of the scarp walls during this period is somewhat vague but it appears that they were stuccoed and painted ocher by at least 1829;<sup>(17)</sup> and either ocher-washed or grey-washed during the remainder of the period up to 1860. Traces of lime-oyster shell stucco or heavy lime-wash can be found on all vertical surfaces pre-dating 1860. These traces are particularly evident in the frieze of the cordon.<sup>(18)</sup> (Photo 28)

12. Ibid., pp 71, 74
13. Ibid., p. 74
14. Ibid., p. 91
15. Cullum to Totten, Mr. 31, 1855
16. Bearss, Fort Moultrie No. 3, p. 92
17. Wharton to Jesup, April 17, 1829, Ibid. p. 40
18. An inspection in October of this year of Castle Pinckney, erected in the same period as Moultrie, revealed that it was also lime-washed. Further evidence of the fact that the walls of Moultrie were stuccoed was found in October 1973 when one of the original 1808 mortar joints was uncovered. This proved to be an inverted V-shaped joint; one which absolutely required a stucco cover for protection. (Photo 29)



By 1830 it was reported that "...vegetation...had taken place in the joints, and...that most of the pointing had disappeared..." in the scarp wall.<sup>(19)</sup> The walls were apparently repointed with a fine white lime mortar struck flush. (Photos 22 and 29)

The old Storage Magazine, the only remaining structure within the walls of Fort Moultrie which dates to the original construction of 1808, was shown on both Macomb's 1808 plan and Poussin's 1827 plan. Mansfield's drawing of 1830 renders the Magazine in some detail in both plan (scale 1" = 30') and transverse section (scale 1" = 12'). Even more specific detail is given by Bowman's drawings of 1839 and 1840. (Plates ) Bowman's correspondence further elucidates the appearance of the structure. (20)

The Magazine was a free-standing, brick structure, rectangular in plan (24 ft. X 37 ft.), with a barrel-vault roof, double sloped on the exterior, with gables. The interior was one open space (15 ft. X 28 ft.) with a door on the south and a window on the north. Typical through-the-wall baffled ventilators were provided, two on the east and two on the west wall.

Several references during the 1830's mention the composition of the roof as being "tile" over shingles. Although the "tile" is nowhere defined, it is probable that the reference is to slate tile.<sup>(21)</sup>

19. Bearss, Fort Moultrie No. 3, p. 70

20. Bowman to Gratiot, March 10, 1835; Bowman to Totten, May 22, 1839; Bowman to Totten, Jn. 19, 1839

21. Mr. Bearss has recently searched archival records for further documentation but none was found.



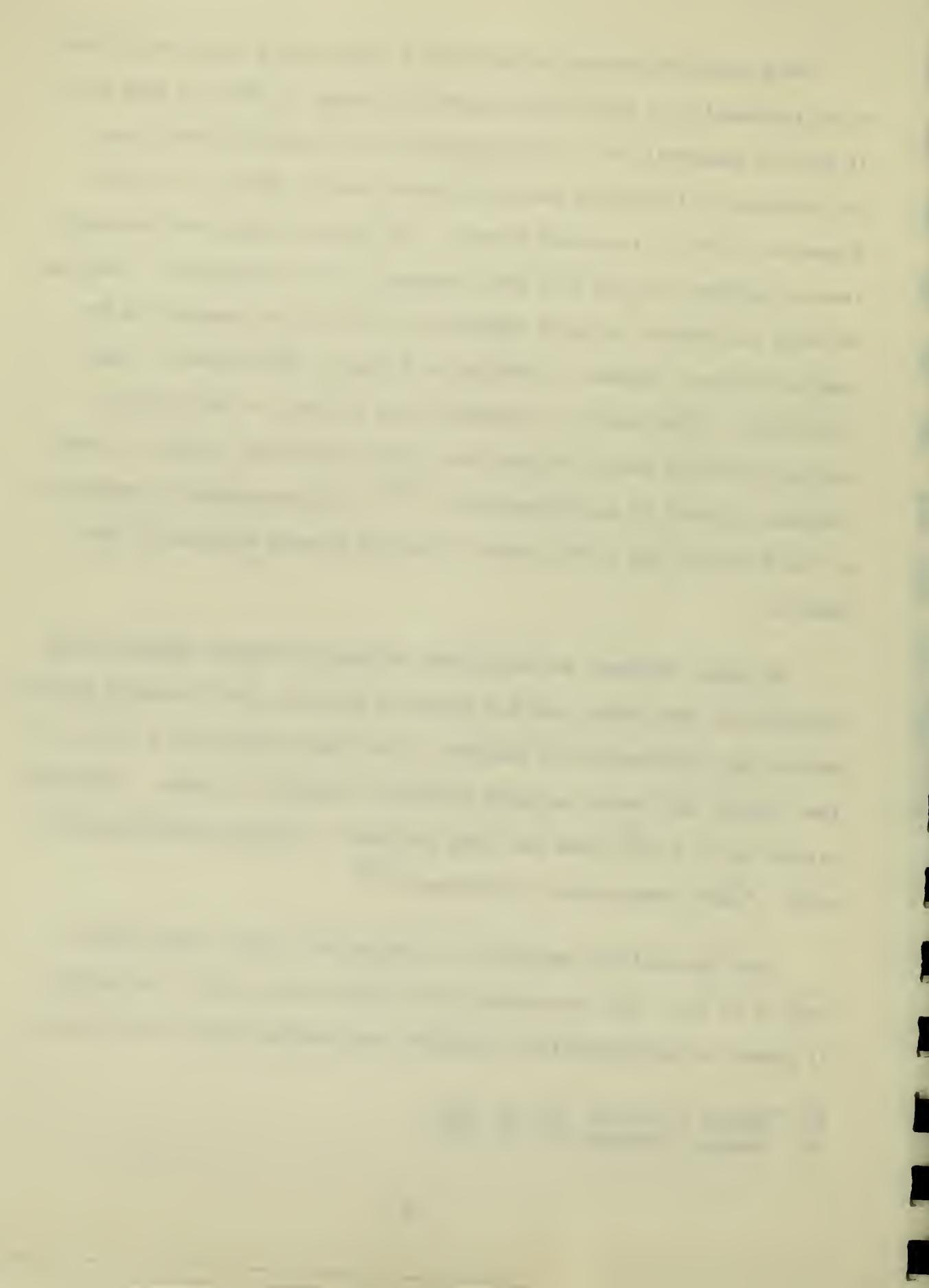
The transverse section on Mansfield's 1830 drawing shows the doorway to be rectangular in shape while Bowman's drawings of 1839 and 1840 show it to be a segmental arch. Investigation of the present fabric finds a red free-stone lintle over the north window opening (Photo 30) and the fragments of one in the south doorway. The doorway lintle was apparently removed between 1830 and 1840 and a segmental arch constructed. This type of stone was subject to great deterioration due to the humidity in the Charleston area. Bowman, in writing to Totten in 1836 stated "...Red free-stone, I find will not withstand this climate --- The soles of the embrasures in Castle Pinckney have lost nearly half an inch of their thickness already by disintegration." (22) This phenomenon is manifested by the lintle of the north window in the old Storage Magazine at Fort Moultrie.

The plan, sections and elevations of the old Storage Magazine drawn by Bowman in 1840 along with his letter of June 19, 1839, provided specific data on the construction of the work. The floor joists were 3 X 6's, two feet "apart" and rested on brick "pillars" elevated 15 inches. The north window was 3' 1-1/2" from the floor and had "...shutters inside and outside..." with "composition" fastenings. (23)

From the earliest mention of the Magazine in 1811 it was always said to be dry. All references in the 1830's state that it was unlined. It cannot be determined from available data whether there was an original

22. Bowman to Totten, May 22, 1839

23. Bowman to Totten, Jn. 19, 1839



wood lining or not.

In this regard in his report of March 10, 1835 to Gratiot, Bowman stated that the Magazine at Castle Pinckney was "...lined on the inside with wood."<sup>(24)</sup> Bowman provided further data on the Castle Pinckney lining in his response to Totten on May 22, 1839, stating that the magazine "...has been ceiled, but the ceiling has nearly all fallen, from the effect of moisture. The wood in all southern magazines which I have ever seen, mildews and decays." Bowman continued, relating his observations and thoughts on the problem of condensation in "southern" magazines.<sup>(25)</sup> Totten finally responded to Bowman in a letter of November 9, 1840 wherein he relayed specific instructions for lining the Fort Moultrie Magazine (see Appendix). Bowman notified Totten on March 19, 1841 that "The Magazine is finished."<sup>(26)</sup> On June 2 of that year, following his inspection of the work, Totten suggested minor changes to Bowman, including "...cutting off the Magazine doors and raising the sills and floor of the entrance to the height of the floor within."<sup>(27)</sup>

Little work was done on the Magazine after 1841 except for slight repairs in 1855.<sup>(28)</sup>

At some point prior to 1859 the exterior walls of the Magazine had received a coat of lime stucco. In an estimate for repairs for the fort

24. Bowman to Gratiot, Mr. 10, 1835

25. Bowman to Totten, My. 22, 1839

26. Bowman to Totten, Mr. 19, 1841

27. Totten to Bowman, Jn. 2, 1841

28. Bearss, Fort Moultrie No. 3, p. 90



made October 14, 1859 the item of "...scraping masonry of Magazine, re-pointing & grey washing..." was included.<sup>(29)</sup> The necessity for scraping the masonry indicates that there was a coating on the walls. Whether this coating was the stucco which is still partially evident on the walls or whether it was an accumulation of the previous ochre-washes cannot yet be determined. Most of the stucco was removed in 1875.<sup>(30)</sup> (Photos 31, 32)

Another construction feature not documented as to date of construction by available primary sources is the Magazine Anteroom. Only the west wall and the vault of this room remains today. The remaining walls have been removed or replaced by later work. (Photo 33) The plan of the Magazine with the Anteroom as constructed is shown on a drawing which dates from 1875.<sup>(31)</sup> The fact that this work was completed earlier is attested by Gillmore's drawing of the fort in 1869 where the Anteroom is indicated. (Plate )

A search of available records fails to document the actual date of construction of the Anteroom. Several clues, however, point to an 1860 date. All of the work completed in that year between August and December by Captain Foster in anticipation of the Civil War, was constructed of 2-1/2" brick. All brick units for previous work dating back to 1808, were 3" thick. The present east wall of the Anteroom is of 2-1/2" brick, laid in a white lime mortar with coarse shell-aggregate. The other clue

29. Foster to DeRussy, Oct. 14, 1859

30. Bearss, Fort Moultrie No. 3, p. 212

31. Ibid., Plate XL



is Foster's letter to DeRussy of December 13, 1860 where he prefaces a list of the work he had accomplished over the previous three months by the statement: "The accessory defenses that I have created and am now perfecting are important to the defense of [Fort Moultrie]...They comprise, besides the works ordered by the Department..."<sup>(32)</sup> [Underlining supplied] Unfortunately those works were ordered verbally and no written record remains of them. A sketch plan drawn in the margin of a letter from Foster to Totten, January 21, 1861 shows the south front of the Magazine adjoining an extension of the North Parade wall. Further, a photograph made April 16, 1861, three days after the bombardment of Fort Sumter, shows sand bags covering the roof of the Anteroom.<sup>(33)</sup> All of the foregoing indicates a construction date of August - December 1860.

A precedent for the Anteroom and a clue as to its use and function can be found in Bowman's letter to Gratiot on March 10, 1835, conveying descriptions of both the Magazine at Fort Moultrie and that at Fort Pinckney. Of the latter he wrote: "The principal entrance to it is directly from the Parade but there is a small passage through the Pier between it and the adjoining Ordnance Store Room. During an attack the opening from the Parade should be firmly walled up and the necessary communication had through the Ordnance Store Room...The Ordnance Store room is bombproof over head, but the closing wall next the parade is too thin to render it a perfectly safe place for depositing powder."<sup>(34)</sup>

32. Foster to DeRussy, Dec. 13, 1860

33. Plate, CXXI, #3, Atlas to Accompany the Official Records of the Union and Confederate Armies, Plate 71-135c.

34. Bowman to Gratiot, Mar. 10, 1835



It would appear that Foster received verbal orders in August 1860 to construct a similar "Ordnance Store Room" with a "bombproof over head" in front of the Fort Moultrie Magazine. In so doing, the doorway to the Magazine heretofore sheltered only by a meager brick traverse and wood door, was given much greater protection.

### 3. 1860 - 1865 Period

This period brought great changes to Fort Moultrie. Prior to the advent of hostilities, work to prepare the fort "...for a vigorous defense..." was completed and during the course of the war various additional improvements were made. <sup>(35)</sup>

In September 1860, General Totten ordered Lieutenant Foster to undertake certain work which would place the Fort in battle condition. <sup>(36)</sup> Between that date and the Federal abandonment of Moultrie on December 26, 1860 the following work was completed:

- 1) Sand dunes banked up against the seafronts were cut down and a permanent glacis built.
- 2) A shallow wet ditch fifteen feet wide was erected around the work on all sides, except the north, and was fronted with pickets.
- 3) Two flanking caponniers, complete with posterns into the fort, were erected at the southwest and southeast angles.
- 4) Sharp angles of the brick at the salient angles were cut off and repointed so as not to encourage escalade.

35. O.R.Series I, Vol. I, p. 5

36. Bearss, Fort Moultrie No. 3, p. 158



- 5) A bastionet for musketry was constructed at the salient of the Northwest Bastion to command the road to the landing.
- 6) East and West posterns were bricked up.
- 7) The projecting brick cordon was cut off.<sup>(37)</sup>

Between January and April 1861 the South Carolina troops who had occupied the fort following its abandonment by federal troops continued raising earth-works, large traverses and merlons.<sup>(38)</sup>

During the bombardment of Fort Sumter April 12-13, 1861, Fort Moultrie suffered little damage with the exception of the Barracks and Officers' Quarters.<sup>(39)</sup>

Further changes were undertaken in response to General Gillmore's land thrust in August 1863 when parts of the damaged Officers' Quarters and the Barracks were taken down and new, larger traverses erected. It was at this time that "...the task of converting Fort Moultrie from a masonry work, vulnerable to the fire of heavy rifled guns, into a 'powerful earth work by banking sand against the scarp wall, and by the introduction of numerous traverses' was begun."<sup>(40)</sup>

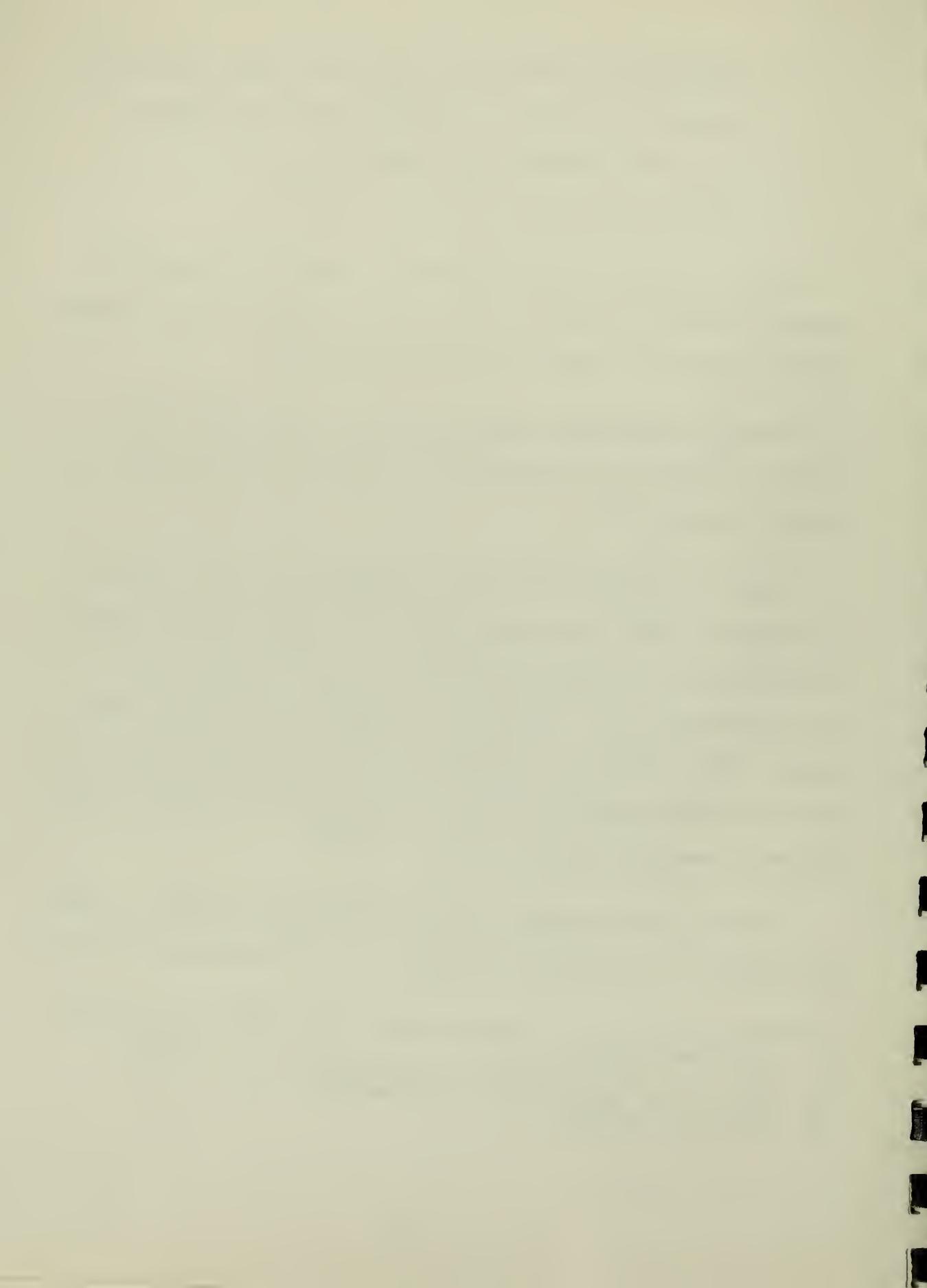
Following the engagement with the Union monitors October 7-8, 1863, the remainder of the Officers' Quarters and the Barracks which were even

37. O.R.Series I, Vol. I, pp. 5-6, 70-71, 73-74, 78-79, 83, 85-88, 92  
95, 98-99, 105-107

38. Ibid., pp. 138-139, 143-144, 146-147, 171-172, 177, 181-182

39. Bearss, Fort Moultrie No. 3, pp. 166-167

40. Ibid., pp. 171-172



more heavily damaged in the engagement, were completely razed. (41)

By 1868 Fort Moultrie was little changed from its war-time appearance.

(Photos, Appendix) On January 31, 1868 Gillmore described it as follows:

Fort Moultrie, was converted during the war into a massive earth-work, by covering with sand inside and outside, all the masonry on the channel faces, and on the adjacent portions of the east and west faces as far as the posterns. On the exterior this mass of sand slopes down to the natural surface of the site, and on the interior terminates on the parade, where several bomb-proof shelters resting against the parade-wall have been constructed. On the terreplein are numerous traverses. The only portions of the scarp wall that could be seen are the gorge throughout its entire length, and the adjacent portions of the east and west faces as far as the posterns. Most of the parade wall can also be seen inside the bomb-proof shelters constructed against it. It does not appear to have been injured by the weight of sand over it, and in my judgement the scarp-wall will also be found intact, when uncovered.

The work will require extensive repairs, but I do not recommend the expenditure of any money upon it, until its thorough restoration can have been commenced. Neither the site nor any buildings pertaining to the work need any attention at the present time. (42)

The accuracy of this appearance is borne out by the drawings made by A. H. A. Becker in 1865 to accompany a report by Major C. R. Suter on the condition of the Fort. (Plate ) Accurate in all regards, with one exception, these drawings consisting of plans, sections and elevations when correlated with period photographs and written descriptions, give us an accurate concept of the Civil War period Fort Moultrie.

The one glaring error in Becker's plan is the delineation of the old

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41. Ibid., p. 174

42. Gillmore to Humphreys, Jan. 31, 1868



Storage Magazine in the northwest bastion. Becker's drawings show a rude timber-framed structure which never was. It would appear that the explanation for the error is that Becker or one of his draftsmen inadvertently substituted the plan of one of the other Charleston Harbor wartime constructions for that of the Moultrie Magazine.

#### 4. The Period 1872 - 1876

Following the Civil War, the United States' fortification system was given close study for the purpose of determining physical and technical improvements required as a result of the destructive power of the new, larger rifled guns. It was finally determined that earth would replace masonry as the principal substance of fortification protection and by 1872 plans were well along to significantly transform Fort Moultrie's physical appearance to conform to the new concept. (43)

The new work was begun in 1872 and by its termination in 1876 various significant changes were made. (Plate \_\_\_\_ [1874-77 plans]) At the outset, everything within the scarp walls was systematically removed with the one exception of the old 1808 Storage Magazine in the Northwest Bastion. This work included the removal of the ruins of the Sally Port, the parade walls, the breast-height walls, parapets, tie-walls, counter-forts, cisterns, ramps and all of the earth and timber bombproofs erected during the Civil War. All that remained of the 1808 Fort Moultrie was the scarp

43. Bearss, Fort Moultrie No. 3, pp. 181-187

44. Ibid., pp. 189-193



9) Drain into the cove		1,000
10) Stone platforms and breast-height walls for 8 guns		25,025
11) Platforms for 5 guns		250
12) Sand filling for traverses (16,000 cu. yds.)		12,000
13) Sand filling for face (10,000 cu. yd.)		7,500
14) Sodding inside of Fort (10,000 sq. yd.)		10,000
15) Sodding face ( 5,000 sq. yd.)		<u>5,000</u>
		\$66,968
	Contingencies	16,742
	Total	\$83,710(46)

### 5. The Period 1877 - 1897

No significant physical changes were made to the fort during this twenty year period. Rather, it was a time of slow deterioration due to the meagerness of appropriated funds.

A significant action occurred during this period, however, which was to create a lasting change for the Fort. This action was the release of the Endicott Board's report in 1886 which drastically modified the concepts for United States' harbor defenses. One of the modifications called for was the installation of submarine mines to protect Charleston Harbor. The need for this minefield to be protected against penetration by destroyers and minesweepers necessitated light guns which could be pointed, loaded, and fired rapidly.<sup>(47)</sup> These changes were not instituted at Fort Moultrie,

46. Ibid., p. 217

47. Ibid., p. 241



wall and the old Storage Magazine. (44)

By 1876 the following work had been accomplished:

- 1) Six service magazines completed
- 2) New Principal Magazine completed
- 3) New Sally Port completed
- 4) East Bombproof completed
- 5) West Bombproof half completed
- 6) Terrepleins and parapets completed
- 7) Scarp walls repaired, repointed and coped (brick on seafronts, artificial stone on north front)
- 8) New gun positions installed
- 9) Old Storage Magazine in Northwest Bastion altered. (45)

By the time Congressional appropriations ceased in 1876 the only remaining work to complete the modernization of Fort Moultrie consisted of:

1) Raising and coping scarp	\$ 1,450
2) Completing Bombproof galleries	1,360
3) Postern and cross galleries	993
4) Side galleries in old magazine	120
5) Floors	560
6) Doors	1,290
7) Lamp closets	120
8) Sally Port Stairs	300

44. Ibid., pp. 189-193

45. Ibid., pp. 193-216



however, until the crisis of the Spanish-American War.

#### 6. The Period 1898 - 1903

The outbreak of war with Spain in April 1898 caused significant changes in the appearance of Fort Moultrie as the findings of the Endicott Board were instituted. These changes consisted of the erection of three concrete gun batteries which replaced gun positions of the 1872-1876 period.

Battery Bingham was begun in April and completed by June 30, 1898. This emplacement consisted of two gun pits separated by an underground service magazine. A gallery was also built to connect the battery with the 1872-1876 Principal Magazine. The two Armstrong 4.7-inch rapid-fire guns were mounted in October and small additions made to the concrete work, including a six-inch thick apron, in November 1898. (48)

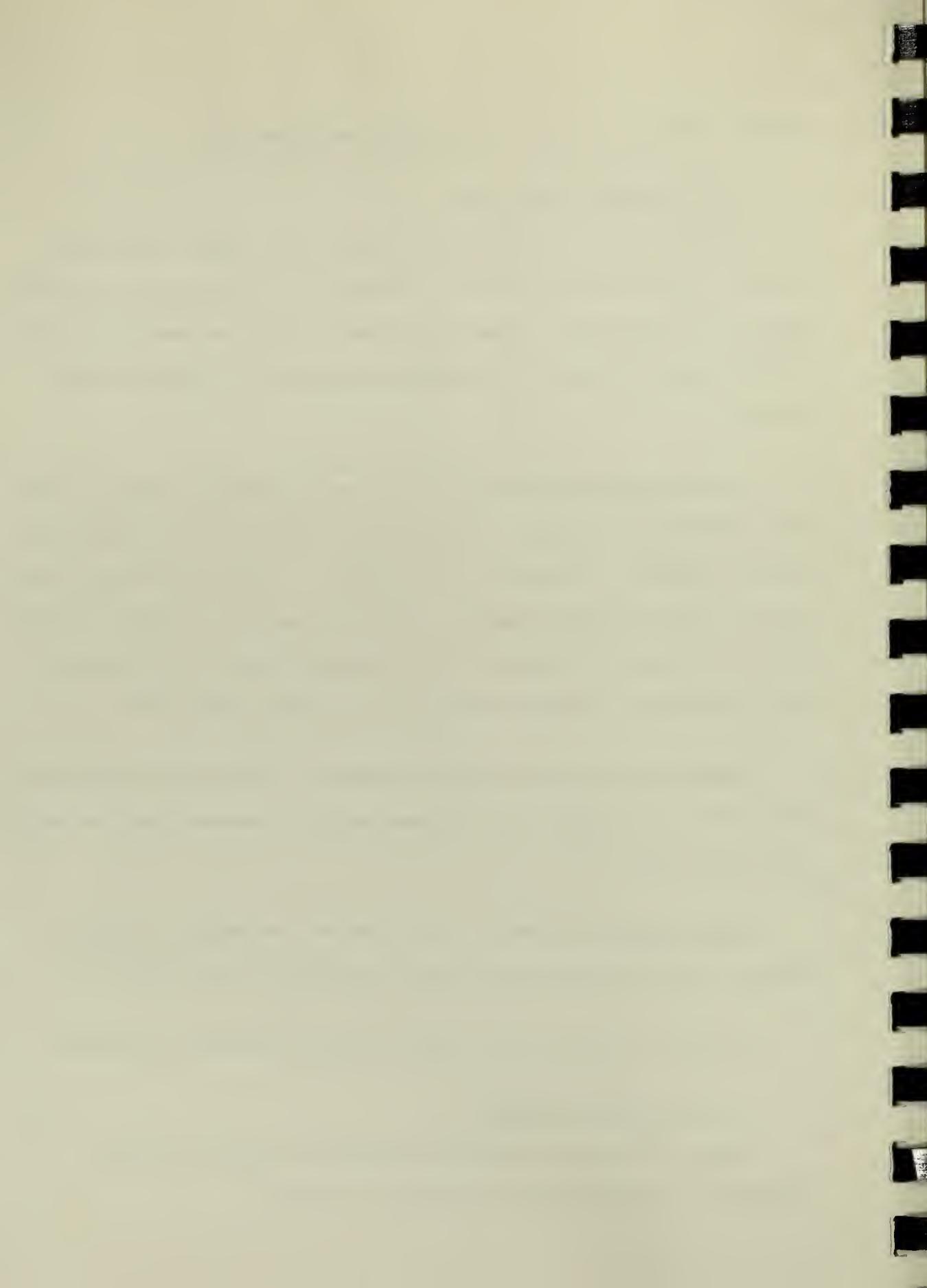
Battery McCorkle was commenced January 2, 1899 and was completed by May of that year but the three Driggs-Seabury 15-pounders were not mounted until April 1901. (49)

Battery Lord was erected in 1903 and the two Driggs-Seabury 15-pounder rapid-fire guns were mounted in December of that year. (50)

All three batteries were coated with black asphaltic compounds.

#### 7. The Period 1904-1944

(Covered by Historic Structure Report and Furnishing Study, HECP/HDCP, in preparation by Mr. Edwin C. Bearss.)



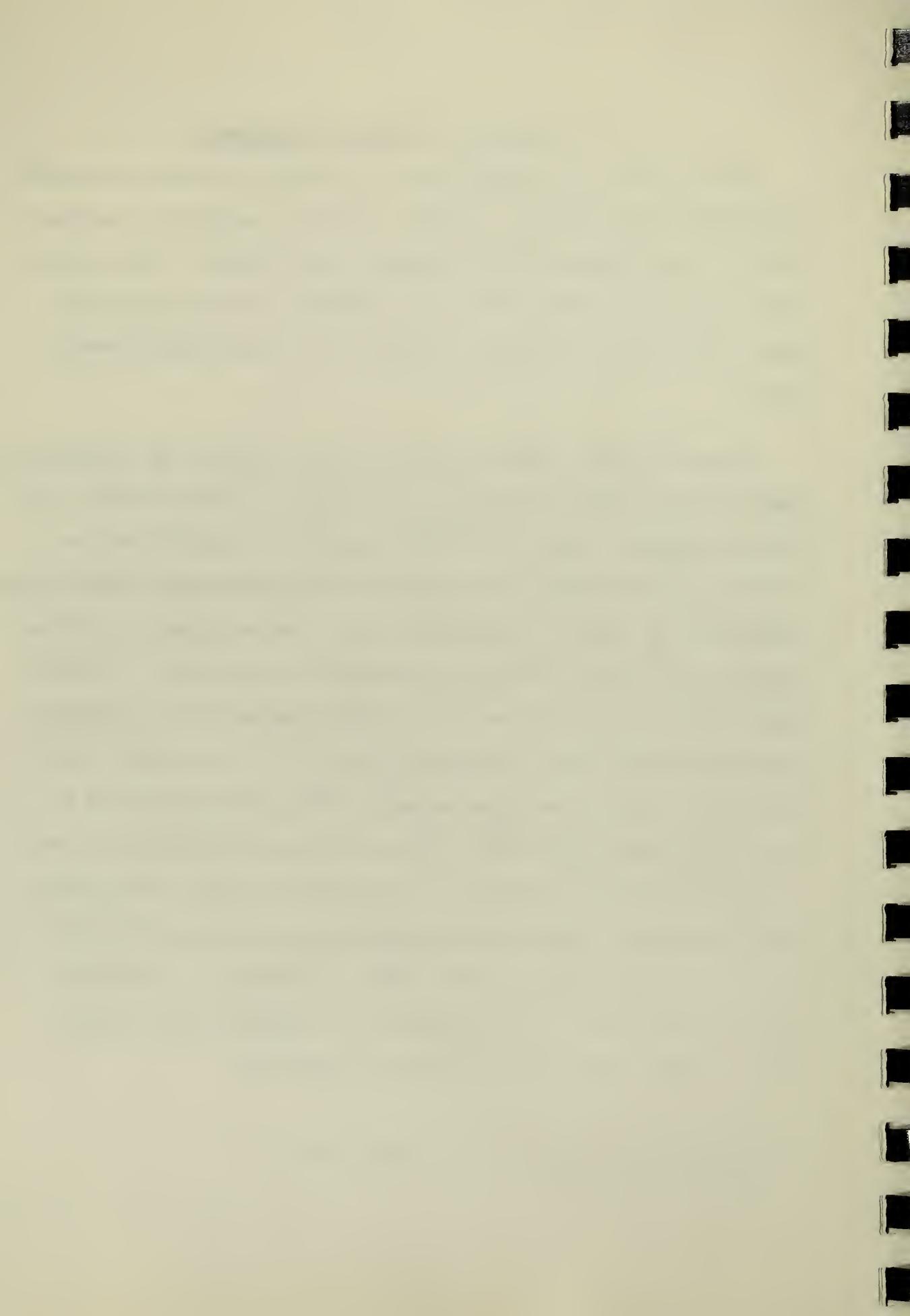
#### F. DESCRIPTION OF PROPOSED DEVELOPMENT

Fort Moultrie as it exists today is a melange of historic structures representing several historic periods. The total ensemble is a manifestation of the evolution of harbor defense fortifications in this country over a span of 135 years (1808-1943). Few sites, if any, exist today where this story is contained within the walls of one enclosed fortification.

Recognizing this significant aspect of Fort Moultrie, an interpretive plan has been developed utilizing a zone concept to make possible a time-capsulated visitor experience.<sup>(1)</sup> This interpretive approach was predicated on the knowledge of the impossibility of returning the fort to any given period of time, save the 20th century. The resulting interpretive plan was a compromise between two unacceptable alternatives: The first alternative was to return the fort to a given period in time; the other was to leave it as it now stands and interpret it in its present state. To return the fort to any given period of time, did not seem to be a reasonable alternative in light of the amount of destruction and reconstruction that would be involved. To interpret the fort in its present state did not make full use of the historic resource since key historic periods, to which visitors seek to relate, are missing. A compromise offered a resolution to the dilemma and the adaptive-use interpretive concept of the Interpretive Prospectus was agreed to.

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1. Interpretive Prospectus; Fort Sumter, June 1973



To make this plan work, the following construction activities will be required:

I. Removal

- 1) Remove Battery Lord, 1903
- 2) Remove gun emplacements 9, 10 and 11 of 1870's period
- 3) Remove granite gun emplacement 12 of 1870's period
- 4) Remove Service Magazine of 1870's period in Northwest Bastion
- 5) Remove West Postern walls and frontspiece of 1870's period
- 6) Remove concrete foundations of Position Finding Station

II. Reconstruction

- 1) Reconstruct gun position 7 and 8 to their date of construction: 1872 (utilizing appropriate elements, if feasible, of Nos. 9, 10 and 11 to be removed)
- 2) Reconstruct southwest seafront gun positions to the 1863-1865 Civil War period
- 3) Reconstruct West Postern to its 1808-1860 period.
- 4) Reconstruct the West and part of the North Parade wall to 1808-1860 period
- 5) Reconstruct parapets, terreplein, gun positions, etc., at salient of Northwest Bastion to 1808-1840 period

III. Restoration

- 1) Restore west wall of Northwest Bastion to 1808 period
- 2) Restore old Storage Magazine, Northwest Bastion to 1840 period



- 3) Restore all other historic structures within and including  
the scarp walls to the period of their construction



## G. RECOMMENDATIONS FOR REMOVAL, RECONSTRUCTION AND RESTORATION

- 1) Remove Battery Lord: (50' x 100' including blast apron).  
Emplacement and blast apron are made of granite-aggregate.  
Maximum thickness of emplacement is 12 feet; of blast  
apron, 1 foot.

Battery Lord has little historic significance. It was erected as an afterthought in 1903 and architecturally represents only slight modifications from Battery McCorkle. Core testing should be made to determine whether the emplacement can be broken up and removed by machinery (back-hoe) or whether blasting will be required. Measured drawings and record photographs must be made before removal.

- 2) Remove gun emplacements 9, 10 and 11:

Prior to removal these emplacements should be excavated and carefully measured and photographed. The iron and timber members should be carefully removed and preserved. If possible, two of the concrete foundations (maximum thickness - 5 feet) should be removed intact for reuse in gun positions 7 and 8.

- 3) Remove gun position 12:

This position is the only one of the 1870's constructed of granite. This position should be removed after careful



measurements and photographs.

4) Remove Northwest Bastion Service Magazine

(16' X 28', maximum thickness of concrete - 6 feet.)

Although the argument here is perhaps strongest against the removal of historic fabric since this structure is in relatively good condition, it would be a significant intrusion in the proposed 1808-1840 scene. This magazine is also similar in design to the remaining 1870 period four service magazines and the impact of its loss would thereby be lessened.

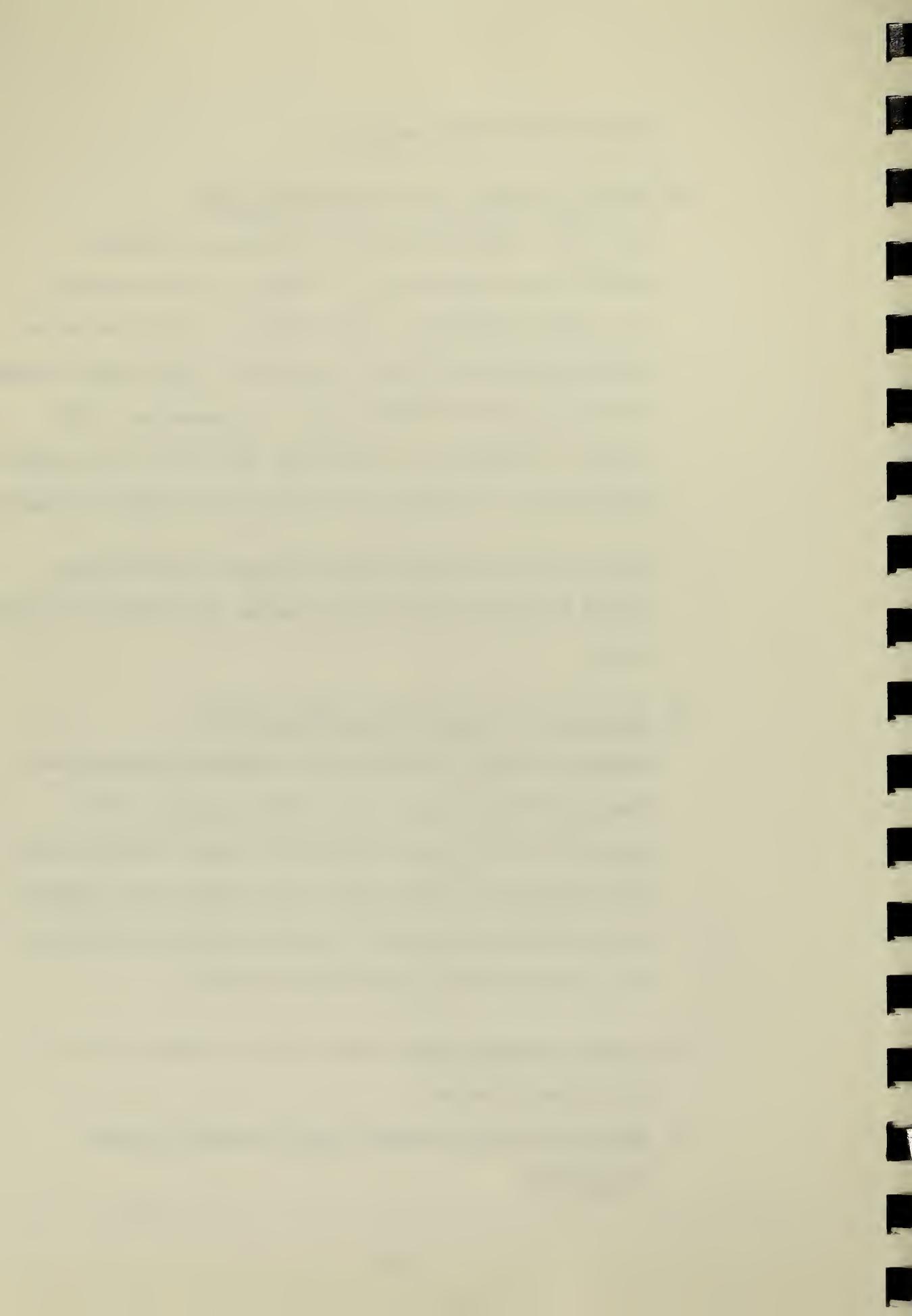
Again, measured drawings and photographic documentation should be made as well as core testing as called for Battery Lord.

5) Remove west Postern walls and Frontspiece:

During the work of the 1870's the 1808 brick postern was removed and the present oyster shell-aggregate walls erected. The new postern walls were never completed above their present 5'6" level nor did the postern ever function as a covered passage after this time. Measured drawings and photographs will record this structure.

6) Remove concrete pylons flanking Middle Street in front of Northwest Bastion.

7) Reconstruct gun positions 7 and 8 to their historic period-1872



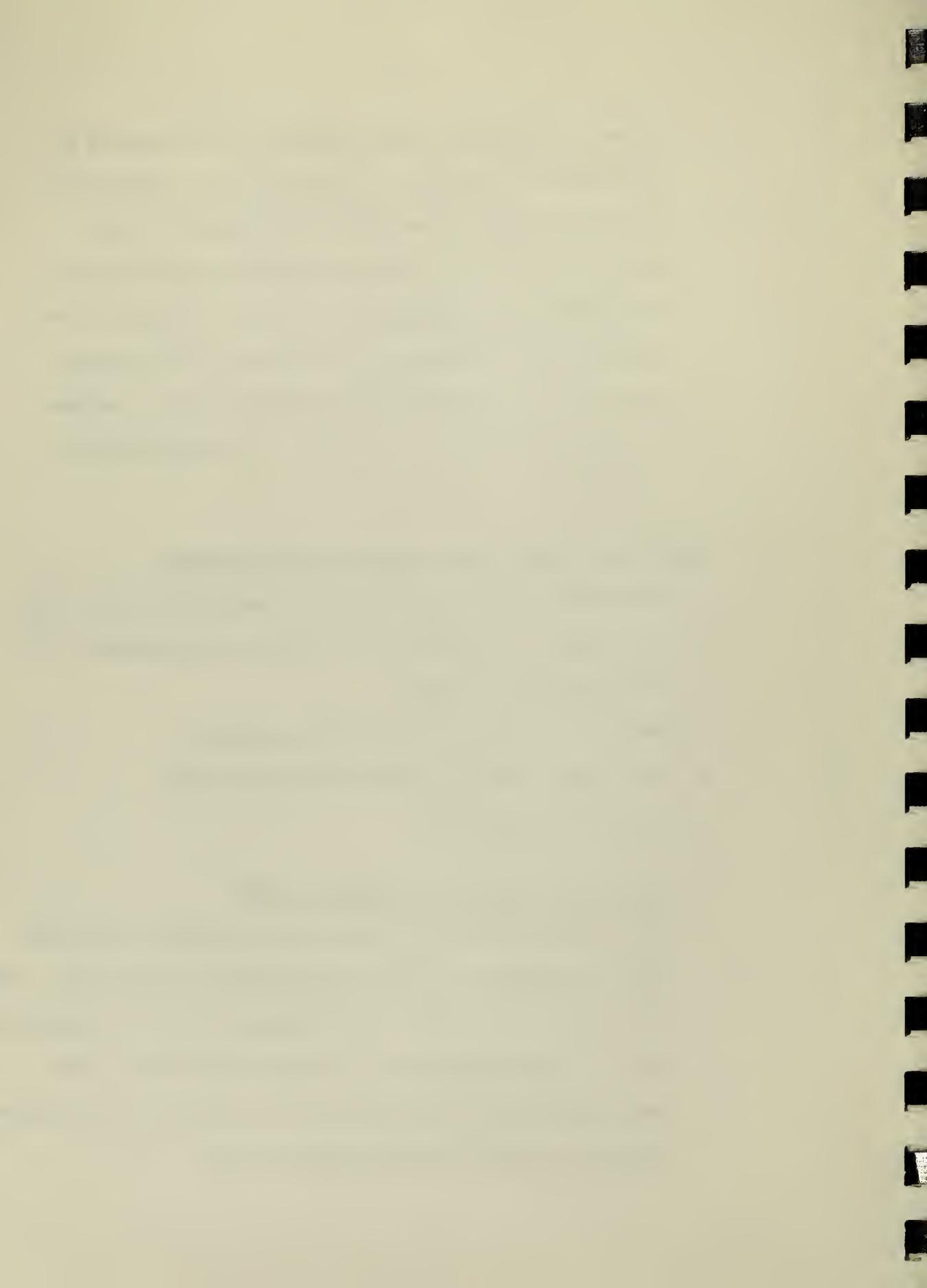
These were among the first positions to be completed in the 1870's modernization of Fort Moultrie. Although destroyed for the construction of Battery Lord in 1903, sufficient details for this construction can be found on the drawing: Fort Moultrie, S. C., 1877 (NA, RG. 77, Dr. 65, Sht. 25). Section A B C D (Scale 1" = 10') bisects position No. 7. Also, further detail as well as pattern or salvage parts will be available from gun positions 9, 10 and 11.

Major work elements will consist of the following:

- a) Reestablish proper grade following removal of Battery Lord
- b) Pour concrete foundations (if those of gun positions 9, 10 and 11 cannot be reused)
- c) Restore or reconstruct gun platform timbers
- d) Reconstruct earth and sod breast-height walls
- e) Reestablish earth grade

8) Reconstruct southwest seafront to 1863

This reconstruction will exhibit the evolution of the fort and its armament during the short period of three years. It will consist of two heavy earth traverses and the emplacement of one 8 inch Brooke Rifle and one 10" Columbiad. Two photographs (1865) as well as Suter's drawing (1865) provide sufficient detail for this reconstruction.



9) Reconstruct remainder of West and Northwest Bastions to period 1808 - 1860:

This would consist of reconstructing the parade wall, breast height wall and terreplein. Adequate data for accurate reconstruction can be obtained from 1865 photographs, period drawings and reports and parts of the old walls enclosing the old Storage Magazine, Northwest Bastion.

10) Restore West Wall of Northwest Bastion to 1808 period:

This would consist of lowering the scarp wall and reconstructing embrasures, terreplein, coverline wall, and gun positions.

11) Restore old Storage Magazine, Northwest Bastion to 1840 period

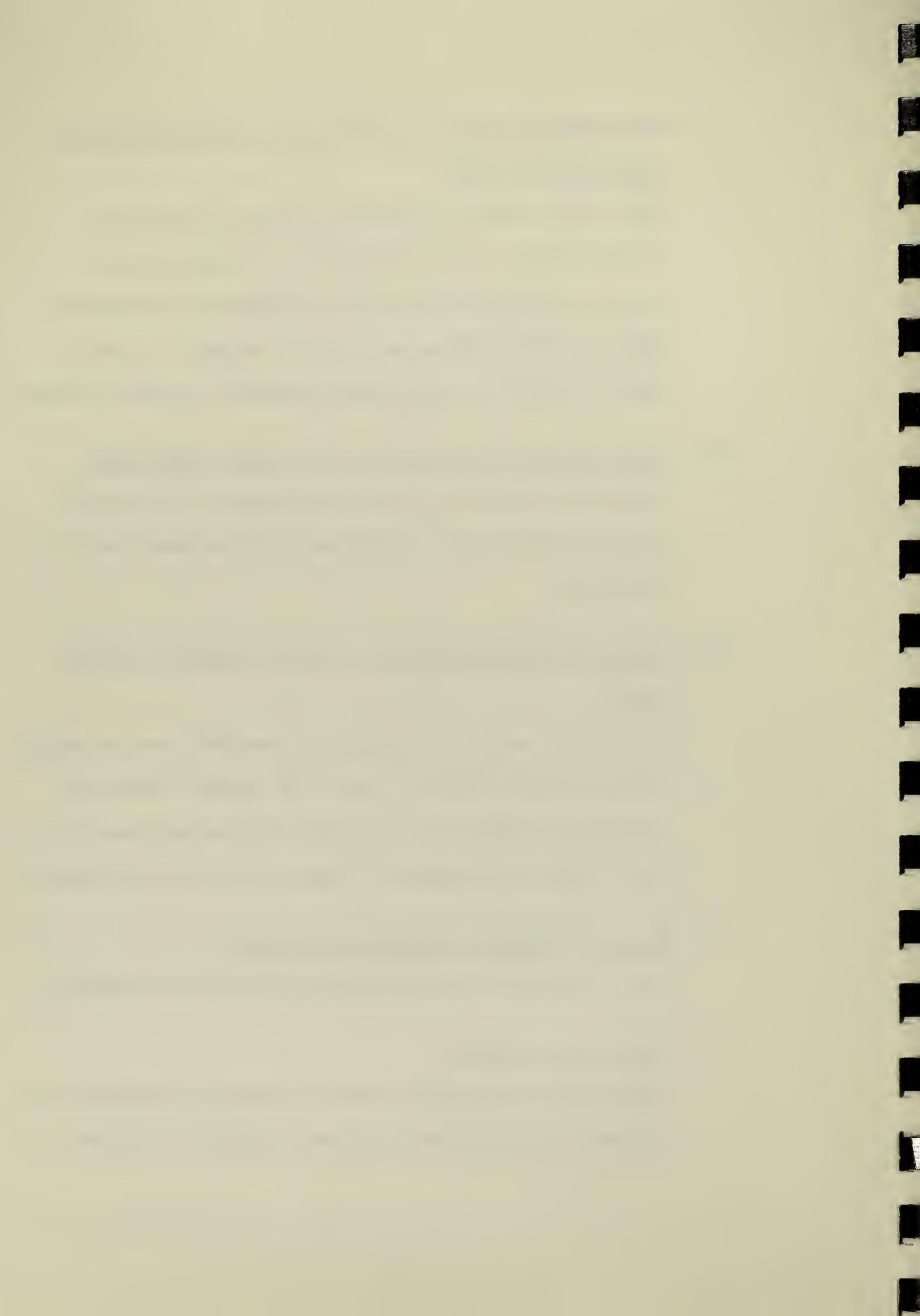
This would consist of removing all post-1860 work including the earth cover, concrete roof, side gallery vaults and restoring the structure as a free-standing building. All brick should be salvaged for reuse in postern construction.

12) Restore remainder of Historic Structures:

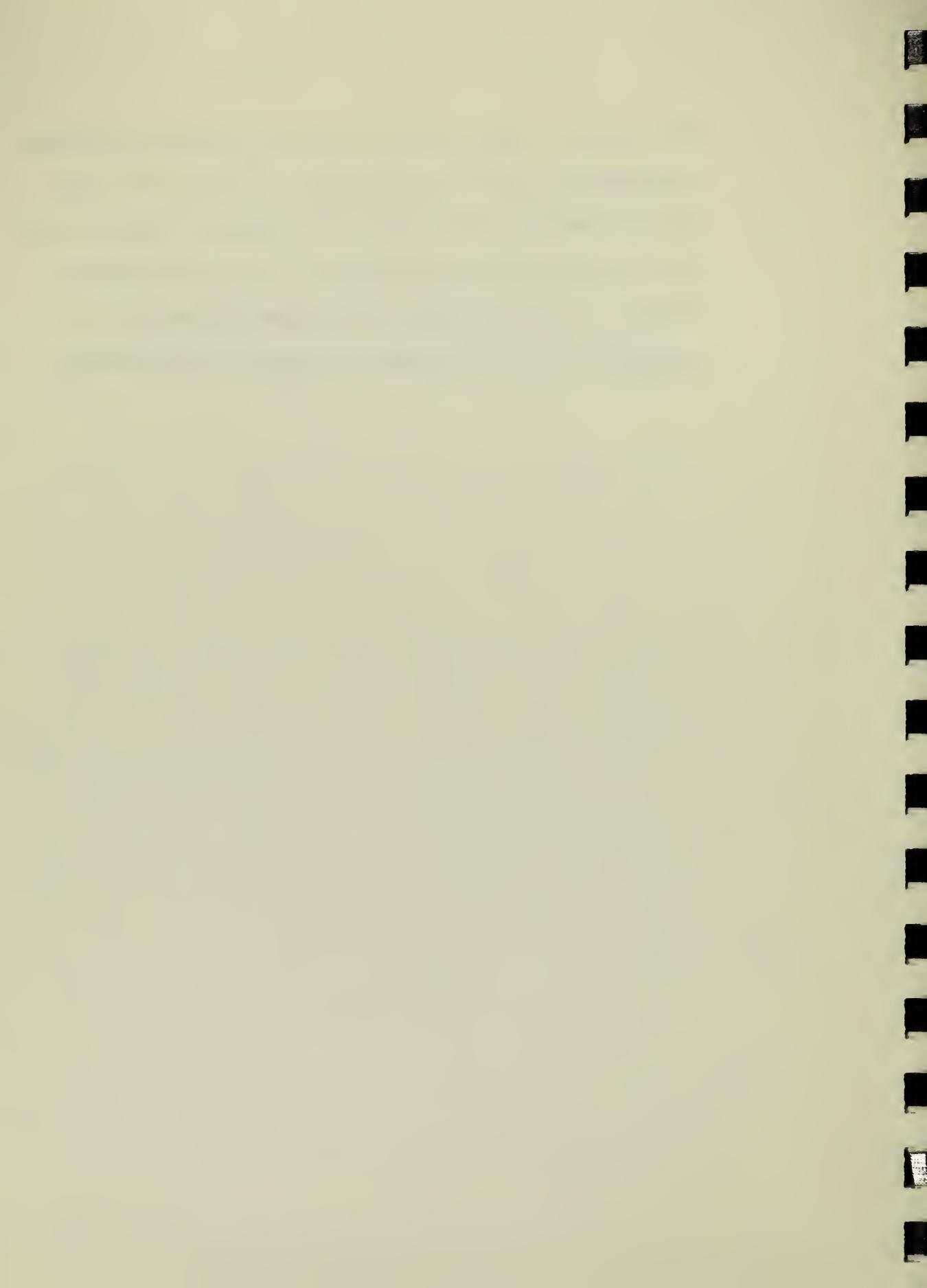
Minor restoration of the historic fabric will be required.

13) Restore Scarp Walls:

The present scarp walls retain their basic appearance as of 1808 with the exceptions as noted in previous sections of



this report. Restoration will consist primarily of repacking eroded mortar joints and repointing. As part of this work the walls should be excavated to the bottom of the foundations and all sub-surface joints repaired. Once the foundation trenches have been backfilled the ground surface should be returned to the grade as shown on Mansfield's 1830 drawing.



**ESTIMATE OF COSTS**

**SECTION H**

**[ TO BE FURNISHED BY DENVER SERVICE CENTER]**



**RECOMMENDATIONS FOR FURTHER RESEARCH**

**SECTION I**



**APPENDIX**

**V**



**ABATIS (French)**--are rows of felled trees deprived of their smaller branches, the remainder sharpened to a point and employed for defence. Abatis should be placed so as not to be exposed to the fire of artillery. In redoubts or intrenchments, they are usually fixed in an upright position against the counterscarp, or at the foot of the glacis, the plane of which is broken so as to conceal the abatis from the view of the enemy, and to guard against obstructing the musketry fire from the parapet in their rear.

**ADVANCED COVERED WAY**-- is a terre plein, on the exterior of the advanced ditch, similar to the first covered way.

**ADVANCED DITCH**--is an excavation beyond the glacis of the enceinte, having its surface on the prolongation of that slope, that an enemy may find no shelter when in the ditch.

**ADVANCED LUNETTES**--Are works resembling bastions or ravelins, having faces and flanks. They are formed upon or beyond the glacis.

**ADVANCED WORKS**--are such as are constructed beyond the covered way and glacis, but within the range of the musketry of the main works.

**ANGLE OF DEFENCE**--is that formed by the meeting of the flank and line of defence, or the face of the bastion produced.

**ANGLE OF THE POLYGON**--is that formed by the meeting of two of the sides of the polygon; it is likewise called the polygon angle.

**BANQUETTE**--is the step of earth within the parapet, sufficiently high to enable the defenders, when standing upon it, to fire over the crest of the parapet with ease.

**BARBETTE**. Guns are said to be in barbette when they are elevated, by raising the earth behind the parapet, or by placing them on a high carriage, so that, instead of firing through embrasures, they can be fired over the crest of the parapet. In this position, the guns have a wide range, instead of being limited, as in firing through embrasures.

**BARRIER**. Carpentry obstructions in fortifications. The purpose regulates the construction. If the barrier is to be permanently defensible, palisading will suffice, with a sand-bag or other temporary parapet when required, behind and near enough to fire between the palisades. The gates in both the above should, if possible, be of palisading, as the heavy stockade gate is unwieldy. Barrier gates should never be left unprotected.

**BASTION**. A work consisting of two faces and two flanks, all the angles being salient. Two bastions are connected by means of a CURTAIN,



which is screened by the angle made by the prolongation of the corresponding faces of two bastions, and flanked by the line of defence. Bastions contain, sheltered by their parapets, marksmen, artillery, platforms, guards. They are protected by galleries of mines, and by demi-lunes and lunettes outside the ditch, and by palisades if the ditch is inundated. Bastions should be large, and contain five or six hundred infantry, with the necessary artillery. The boyaux of the besiegers are directed towards the CAPITAL of the Bastion. The Faces of the Bastion are the parts exposed to being enfiladed by ricochet batteries, and also being battered in breech. (See Fortification)

BATARDEAU--is a strong wall of masonry built across a ditch, to sustain the pressure of the water, when one part is dry and the other wet. To prevent this wall being used as a passage across the ditch, it is built up to an angle at top, and armed with iron spikes; and to render the attempt to cross still more difficult, a tower of masonry is built on it. In the batardeau is the sluice-gate, by the opening or closing of which the manoeuvres of the water can be regulated. (See Ditch.)

BERME. Narrow path round fortifications, between the parapet and the ditch, to prevent the earth from falling in.

BLINDAGE. A siege work contrived, when defilement is impossible, as a shelter against a cross or ricochet fire of artillery. It is also used to guard against the effects of shells. The powder magazines, the hospitals, the cisterns, certain doors and windows are thus blinded by means of carpentry work, or shelters loaded with earth, dung, &c. Blindage of the trenches is also necessary, particularly when the besiegers begin the crowning of the covered way by means of the sap. Blindages are thus used to guard against stones or hand grenades thrown by the besieged. This blindage is entirely exposed to sorties, and also to the danger of being burned by the besieged.

BREASTWORK--is a hastily constructed parapet, not high enough to require a banquette, or at least generally without one; (See Field Works.)

CAPONNIERE. Passage from the place to an outwork; it is either single or double, sometimes bomb-proof and loopholed. (See Fortification.)

CAVALIER--is a term applied to a work of more than ordinary height. It is sometimes constructed upon the terre-plein of the bastion, with faces and flanks parallel to those of the bastion which it commands. Cavaliers are not confined to bastions, but are placed wherever a great command of fire is required, and are sometimes traced straight, on other occasions curved.

CHEMIN DES RONDES--is a berme from four to twelve feet broad, at the



foot of the exterior slope of the parapet. It is sometimes protected by a quickset hedge, but in more modern works by a low wall, built on the top of the revetment, over which the defenders can fire, and throw hand grenades into the ditch.

CHEVAUX-DE-FRISE. The principal uses of chevaux-de-frise are to obstruct a passage, stop a breach, or form an impediment to cavalry. Those of the modern pattern are made of iron, whose barrel is six feet in length, and four inches in diameter, each carrying twelve spears, five feet nine inches long, the whole weighing sixty-five pounds.

CITADEL. A citadel is a small strong fort, constructed either within the place, or on the most inaccessible part of its general outline, or very near to it; it is intended as a refuge for the garrison, in which to prolong the defence, after the place has fallen.

COLUMBIAD. An American cannon invented by Colonel Bomford, of very large calibre, used for throwing solid shot or shells, which, when mounted in barbette, has a vertical field of fire from 5° depression to 39° elevation, and a horizontal field of fire of 360°. Those of the old pattern were chambered, but they are now cast without, and otherwise greatly improved. The 10-inch weighs 15,400 lbs., and is 126 inches long. The 8-inch columbiad is 124 inches long and weighs 9,240 lbs. Rodman's 15-inch columbiad, ...was cast at Pittsburgh, Pennsylvania, by Knapp, Rudd & Co., under the directions of Captain T. J. Rodman, of the Ordnance Corps, who conceived the design, which he has happily executed, of casting guns of large size hollow, and by means of a current of water introduced into the core, which forms the mould of the bore, cooling it from the interior, and thus making the metal about the bore the hardest and densest, and giving the whole thickness of metal subjected to internal strain its maximum strength. The gun has the following dimensions:

Total length . . . . .	190	inches.
Length of calibre of bore, . . . . .	156	"
Length of ellipsoidal chamber . . . . .	9	"
Total length of bore, . . . . .	165	"
Maximum exterior diameter, . . . . .	48	"
Distance between rimbases, . . . . .	48	"
Diameter at muzzle, . . . . .	25	"
Thickness of metal behind the chamber . .	25	"
Thickness at junction of bore with chamber	16-1/2	"
Thickness at muzzle, . . . . .	5	"
Diameter of shell, . . . . .	14.9	"
Weight of gun, . . . . .	49,100	lbs.
Weight of shell, . . . . .	320	"
Bursting charge, . . . . .	17	"



The gun is mounted upon the new iron centre pintle carriage,...which with requisite lightness has great strength and stiffness; and to facilitate the pointing from 5° depression to 39° elevation, a slot is cut in the knob of the cascable, and a ratchet is formed on the base of the breech to receive a "pawl" attached to the elevating screw. If the distance be greater than the length of a single notch of the ratchet, the piece is rapidly moved by a lever which passes through an opening in the pawl. If the distance is less, then the elevating screw is used. The piece was fired and manoeuvred during the trials at Fort Monroe, with great facility, being manned by 1 sergeant and 6 negroes; the times of loading were 1'15" and 1'3". Time in traversing 90° 2'20", and in turning back 45° 1'. Time of loading, including depression and elevation, 4' and 3'18".

The mean ranges at 6° elevation, of ten shots, was 1,936 yards, and the mean lateral deviation 2.2 yards, 35 lbs. of .6-inch grain powder being the charge and 7" the time of flight. At 10° elevation and 40 lbs. of powder, large grain, the range was 2,700 yards, and time of flight 11".48. At 28° 35' elevation the range was 5,730 yards, time of flight 27"; and the lateral deviation, as observed with a telescope attached to one of the trunnions, very slight.

CORDON--is the coping of the escarp or inner wall of the ditch, sometimes called the magistral line; as from it the works in permanent fortification are traced. It is usually rounded in front, and projects about one foot over the masonry: while it protects the top of the revetment from being saturated with water, it also offers, from projection, an obstacle to an enemy in escalading the wall.

COUNTER-BATTERY. When a number of guns are placed behind a parapet, for the purpose of dismounting or silencing by direct fire the guns in an enemy's work, it is called a counter-battery.

COUNTERFORTS--are the buttresses by which the revetment walls are backed and strengthened interiorly.

COUNTERGUARD--is a work composed of two faces, forming a salient angle, sometimes placed before a bastion, sometimes before a ravelin, and sometimes before both, to protect them from being breached.

COUNTERMINES--are galleries excavated by the defenders of a fortress, to intercept the mines, and to destroy the works of the besiegers.

COUNTERSCARP. The outer boundary of the ditch--revetted with masonry in permanent fortification to make the ditch as steep as possible.

COUNTERSLOPE. In the case of a revetment, the slope is within instead of on the outside; and is usually formed in steps. In the case of a parapet, the slope is upwards instead of downwards.



COUPURES--are short retrenchments made across the face of any work, having a terre-plein. The ditch of the coupe is carried quite across the terre-plein, and through the parapet of the work in which it is formed, but not through the revetment.

COVERED WAY. A space between the counterscarp and the crest of the glacis in permanent works, and within the palisades, over which the garrison can run without being seen or subjected to the fire of the enemy. The crowning of the covered way by the besiegers is a difficult operation, and often costs them dearly.

CREMAILLERE--is an indented or zigzag outline.

CRENELLATED--loop-holed.

CROTCHETS--are openings cut into the glacis at the heads of traverses, to enable the defenders to circulate round them. These passages are closed by a gate when necessary.

CROWN-WORK--is a similar work to horn-work, but consisting of two fronts instead of one. It is connected to the main works in a similar way, and is used for the same purposes as the horn-work.

CUNETTE--is a narrow ditch in the middle of a dry ditch, to keep it drained, as well as to form, especially when filled with water, an obstacle to an enemy.

CURTAIN. The curtain is that part of the rampart of the body of the place, which lies between two bastions, and which joins their two flanks together.

CURTAIN ANGLE--is that formed by the meeting of the flank and the curtain.

DEAD ANGLE or (DEAD GROUND)--is any angle or piece of ground which cannot be seen, and which therefore cannot be defended from behind the parapet of the fortification.

DEBLAI--is the quantity of earth excavated from the ditch to form the remblai. Under ordinary circumstances the one is equal to the other, but not always; as, from the nature of the soil, earth may have to be brought to supply the remblai.

DEFILADING--consists in raising the parapets of a fortress or field-work, or in depressing the terre-pleins so much as to conceal the interior of the work from the view of an enemy on an elevated position. It also consists in directing the magistral lines of its parapets toward points, where local impediments, as rivers, marshes, lakes, &c., would prevent a besieger from constructing batteries. The former is defilading



by relief, the latter is termed defilading by the trace or plan. When a field-work has been necessarily constructed in such a situation that it may be commanded by some height within range of artillery, the defilading is made by raising the parapet, or constructing traverses in the interior of the work. The necessary trace for a field-work to accomplish these objects is more expeditiously effected by the eye and a few poles and profiles, than by resorting to theoretical and scientific proceedings, which constitute a part of the art of the engineer, and which are indispensable considerations in permanent fortification.

DEFILE. Any narrow passage--as a ford, a bridge, a road through a village, mountain passes, &c., are defiles.

DEMILUNE--is a work constructed to cover the curtain and shoulders of the bastion. It is composed of two faces forming a salient angle towards the country, has two demi-gorges formed by the counterscarp, and is surrounded by a ditch. The demilune is sometimes termed a ravelin.

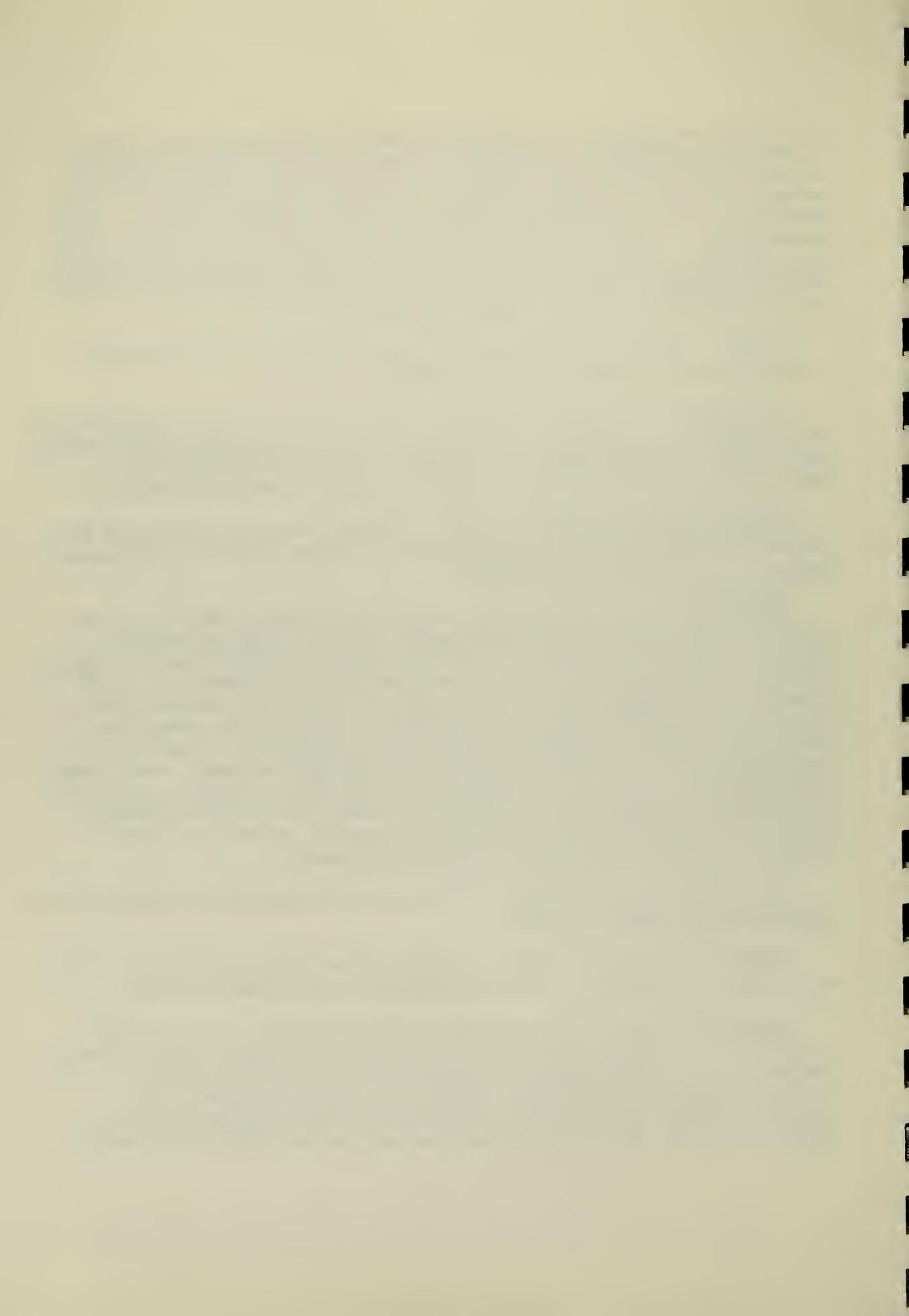
DITCH--sometimes called the Fosse--is the excavation made round the works, from which the earth required for the construction of the rampart, parapet, and banquette is obtained.

EMBRASURE. An embrasure is an opening cut through the parapet to enable the artillery to command a certain extent of the surrounding country. The space between every two of these openings called the merlon, is from 15 to 18 feet in length. The opening of the embrasure at the interior is two feet, while that towards the country is usually made equal to half the thickness of the parapet. The interior elevation of the parapet, which remains after cutting the embrasure, is called the genouillere, and covers the lower part of the gun carriage. The plongee, or slope given to the sole, is generally less than the inclination given to the superior slope of the parapet, in order that the fire from the embrasure may meet that of the musketry from the parapet at a point within a few feet from the top of the counterscarp.

ENCEINTE--is the body of the place, or the first belt of ramparts and parapets that inclose the place.

ENFILADE. To sweep the whole length of the face of any work or line of troops, by a battery on the prolongation of that face or line.

ENGINEER CORPS.... The functions of the engineers being generally confined to the most elevated branch of military science, they are not to assume, nor are they subject to be ordered on, any duty beyond the line of their immediate profession, except by the special order of the President of the United States; but they are to receive every mark of respect to which their rank in the army may entitle them respectively,



and are liable to be transferred, at the discretion of the President, from one corps to another, regard being paid to rank.

ESCARP, (or Scarp)--is the side of the ditch next to the place, which, in permanent fortifications, is usually faced with masonry.

ESPLANADE. Empty space for exercising troops in fortified places.

EXPENSE MAGAZINES--are small powder magazines containing ammunition, &c., made up for present use. There is usually one in each bastion.

EXTERIOR SIDE--is the side of the polygon, upon which a front of fortification is formed.

EXTERIOR SLOPE--is a slope given to the outside of the parapet. It is found by experience that earth of common quality will naturally acquire a slope of  $45^{\circ}$ , even when battered by cannon. This inclination is therefore given to the slope.

FACES OF A BASTION--are the two sides extending from the salient to the angle of the shoulder.

FAUSSE BRAIE--is a second enceinte, exterior to, and parallel to the main rampart, and considerably below its level.

FIELD WORKS. Their object is to provide a body of troops, or a town, with a secure protection against a sudden assault of superior numbers by the interposition of a parapet of some material capable of resisting the effects of projectiles. This parapet may be made of very miscellaneous materials, but is usually of earth, excavated from a ditch which will itself be an obstacle to attack.

FLANK. The right or left side of a body of men, or place.

FLANK OF A BASTION--is that side which connects the face and curtain. It is one of the principal defences of the place, as it protects the curtain, the face, and flank of the opposite bastion, and the passage of the ditch.

FLECHE--is a simple species of field-work. It consists of two faces forming a salient angle. One simple rule for their construction is to select a spot for the salient and throw up a breastwork on either side, forming an angle of not less than  $60^{\circ}$ , and allowing one yard for each file.

FORT--is an inclosed work of the higher class of field-works. The word, however, is loosely applied to other military works.



FORTIFICATION. A fortification in its most simple form consists of a mound of earth, termed the rampart which encloses the space fortified; a parapet, surmounting the rampart and covering the men and guns from the enemy's projectiles; a scarp wall, which sustains the pressure of the earth of the rampart and parapet, and presents an obstacle to an assault by storm; a wide and deep ditch which prevents the enemy from approaching near the body of the place; a counterscarp wall, which sustains the earth on the exterior of the ditch; a covered way, which occupies the space between the counterscarp and a mount of earth, called a glacis, thrown up a few yards in front of the ditch for the purpose of covering the scarp of the main work. The work by which the space fortified is immediately enveloped is called the enceinte, or body of the place. Other works are usually added to the enciente to strengthen the weak points of the fortification, or to lengthen the siege by forcing the enemy to gain possession of them before he can breach the body of the place. These are termed outworks, when enveloped by the covered way, and advanced works, when placed exterior to the covered way, but in some manner connected with the main work; but if entirely beyond the glacis and not within supporting distance of the fortress, they are called detached works. In a bastioned front the principal outwork is the demi-lune, which is placed in front of the curtain; it serves to cover the main entrance to the work, and to place the adjacent bastions in strong re-enterings. The tenaille is a small low work placed in the ditch, to cover the scarp wall of the curtain and flanks from the fire of the besiegers' batteries erected along the crest of the glacis.

The places of arms are points where troops are assembled in order to act on the exterior of the work. The re-entering places of arms, are small redans arranged at the points of juncture of the covered ways of the bastion and demi-lune. The salient places of arms, are the parts of the covered way in front of the salients of the bastion and demi-lune. Small permanent works, termed redoubts, are placed within the demi-lune and re-entering places of arms for strengthening those works. Works of this character constructed within the bastion, are termed interior retrenchments; when sufficiently elevated to command the exterior ground, they are called cavaliers.

Caponnieres are works constructed to cover the passage of the ditch from the tenaille to the gorge of the demi-lune, and also from the demi-lune to the covered way, by which communication may be maintained between the enceinte and outworks. Posterns are underground communications made through the body of the place or some of the outworks. Sortie passages are narrow openings made through the crest of the glacis, which usually rise in the form of a ramp from the covered way, by means of which communication may be kept up with the exterior. These passages are so arranged that they cannot be swept by the fire of the enemy. The other communications above ground are called ramps, stairs, &c. Traverses are small works



erected on the covered way to intercept the fire of the besiegers' batteries. Scarp and counterscarp galleries are sometimes constructed for the defence of the ditch. They are arranged with loopholes, through which the troops of the garrison fire on the besiegers when they have entered the ditch, without being themselves exposed to the batteries of the enemy.

In seacoast defences, and sometimes in a land front for the defence of the ditch, embrasures are made in the scarp wall for the fire of artillery; the whole being protected from shells by a bomb-proof covering overhead; this arrangement is termed a casemate.

FRAISES--are palisades placed horizontally or obliquely, at the edge of a ditch on either side, or projecting from the exterior slope of a parapet. If the slope be very long, there are sometimes two rows of fraises used.

GABIONNADE. A work constructed with gabions.

GABIONS--are cylindrical baskets of various dimensions, open at both ends, used to revet the interior slopes of batteries, the cheeks of embrasures, and to form the parapet of trenches. (See Revetment for the construction of gabions.)

GALLERY. In permanent fortification, a passage or communication to that part of a mine where the powder is lodged. The principal gallery, from which others originate, is constructed under the banquette of the covered way, and follows that portion of the works throughout its whole extent. Another gallery is formed in a direction parallel to the first 50 or 60 yards' distance, and communicates with the first by means of other galleries perpendicular to it. Galleries are lined with masonry. When finished they are about six feet high and four and a half feet wide.

GENOUILLERE. From the French genou, knee. It is that part of the parapet of a battery which remains above the platform and under the gun, after the opening of the embrasure.

GLACIS. The superior slope of the parapet of the covered way, extended in a gentle declivity to the surrounding country. It is seldom used in field-works. (See Fortification.)

GORGE. The gorge of a fortification or gorge of a work is the opening on that side of the work corresponding to the body of the place, or the side whence comes the defence. In isolated works, the gorge is sometimes intrenched. The gorges of works not attached to a fortress, but which are its dependencies, are in general open, or without parapets, in order that the enemy may not cover himself from the fire of the place if he should seize such detached works. If the works are liable to surprise, and their gorges cannot be shut, a row of palisades are planted there, and mines are



prepared so as to overthrow the enemy if he should seize the work, and attempt to construct a lodgement there. The gorge of a bastion is usually an open space between the extremities of the flanks of the bastion. The larger this gorge is, the better is the defence; for when the ruined bastion is about to fall by siege into the hands of the enemy, the defenders can construct defensive works or dig small ditches in the gorge of the abandoned bastion. Such resistance sometimes drives the besiegers to the necessity of battering in breach the curtain.

HORN WORK--is a work composed of two half bastions and a curtain or a front of fortification, with two long sides called branches or wings, directed upon the faces of the bastions or ravelins, so as to be defenced by them. This work is placed before a bastion or ravelin, and serves to inclose any space of ground or building, which could not be brought within the enceinte.

INTERIOR FLANKING ANGLE--is formed by the line of defence and the curtain.

INTERIOR SIDE--is the line drawn from the centre of one bastion to that of the next, or the line of the curtain produced, to the two oblique radii of the front.

INTRENCHMENT. A ditch or trench with a parapet; field-works. In permanent fortification, intrenchments are made in various parts of the works to prolong the defence, as a breast-work and ditch at the gorge of the bastion, &c.

LINE OF DEFENCE--is the line which extends from the angle of the polygon or extremity of the exterior side, through the inner end of the perpendicular, to the flank, of the bastion.

LINES. A connected series of field-works, whether continuous or at intervals.

LINES AT INTERVALS--are lines composed of separate field-works, so arranged as to flank and defend one another.

LINES CREMAILLERE--are composed of alternate short and long faces, at right angles to each other.

LINES OF BASTION--as the name indicates, are formed of a succession of bastion-shaped parapets, each consisting of two faces and two flanks, connected together by a curtain.

LINES OF TENAILLES--consist of parapets, forming a series of salient and re-entering angles.



LOOPHOLED GALLERIES--are vaulted passages or casemates, usually placed behind the counterscarp revetment, and behind the gorges of detached works, having holes pierced through the walls, to enable the defenders to bring a musketry fire from unseen positions upon the assailants in the ditch. Loopholes, however, are not confined to galleries. In modern fortifications, the revetments, both scarp and counterscarp, are very generally pierced for a musketry fire.

LOOPHOLES--are apertures formed in a wall or stockade, that through them a fire of musketry may be directed on the exterior ground.

LUNETTES--are redans having flanks parallel to their capitals... The faces and flanks may have any moderate extent, according to the purpose for which they are intended; 50 yards for the face, and 25 yards for the flanks, would be a convenient size for many positions.

MACHICOULIS. A projecting wooden gallery from the second story of a house to enable the assailed to fire down on their opponents.

MAGAZINES. Powder magazines ought to secure an unobstructed circulation of air under the flooring as well as above. The magazine should be opened and aired in clear dry weather; the ventilators should be kept free; and no shrubbery or trees should be allowed to grow so near as to protect the building from the sun.

MAGISTRAL LINE--in a plan, is that which regulates the form of the works. It is that which is first laid down, and from which the other parts of the works are traced. (See Cordon.)

MARTELLO TOWERS--are buildings of masonry, generally circular, and of various dimensions. They are chiefly placed on the seacoast, having a gun on their summit, mounted on a traversing platform, by which it can fire in any direction.

MASKED BATTERY--is when the battery is so concealed or disguised, as not to be seen and recognized by the enemy, until it opens its fire.

MERLON. The space of the parapet between two embrasures.

OUTLINE or TRACING--is the succession of lines that show the figure of the works, and indicate the direction in which the defensive masses are laid out, in order to obtain a proper defence.

OUTWORKS--are such works as are constructed between the enceinte and the glacis, of whatever kind.

PALISADES--are strong palings six or seven inches broad on each side, having about one foot of their summits sharpened in a pyramidal form.



They are frequently placed at the foot of slopes, as an obstacle to the enemy. A large beam or lintel, sunk about 2 of 3 feet, is often used to unite them more firmly. Their tops should be a foot above the crest of the parapet behind which they stand, and in field-fortifications they form a very good obstruction, if protected from artillery. An expeditious mode of planting them, is to sink a small ditch, about 2 feet 6 inches deep, and the same breadth, and to nail the ends of the palisades to a piece of timber, or the trunk of a tree, laid on the bottom of it, and they fill in the earth, and ram it well.

The palisades should be 9 or 10 feet long, so that when finished, the ends shall be at least 7 feet above the ground. They may be made out of the stems of young trees of 6 or 8 inches diameter; but stout rails, gates with the ends knocked off, planks split in half, cart shafts, ladders, and a variety of such things, will come into play, where more regular palisades are not to be had. If the materials are weak, a cross-piece must be nailed to them near the top, to prevent their being broken down, and they must not be placed so close together as to cover an enemy.

PARADOS--is a traverse, covering the interior of a work from reverse fire.

PARALLELS--in the attack of a place, are wide trenches, which afford the besieged troops a free covered communication between their various batteries and approaches, and a secure position for the guards of the trenches.

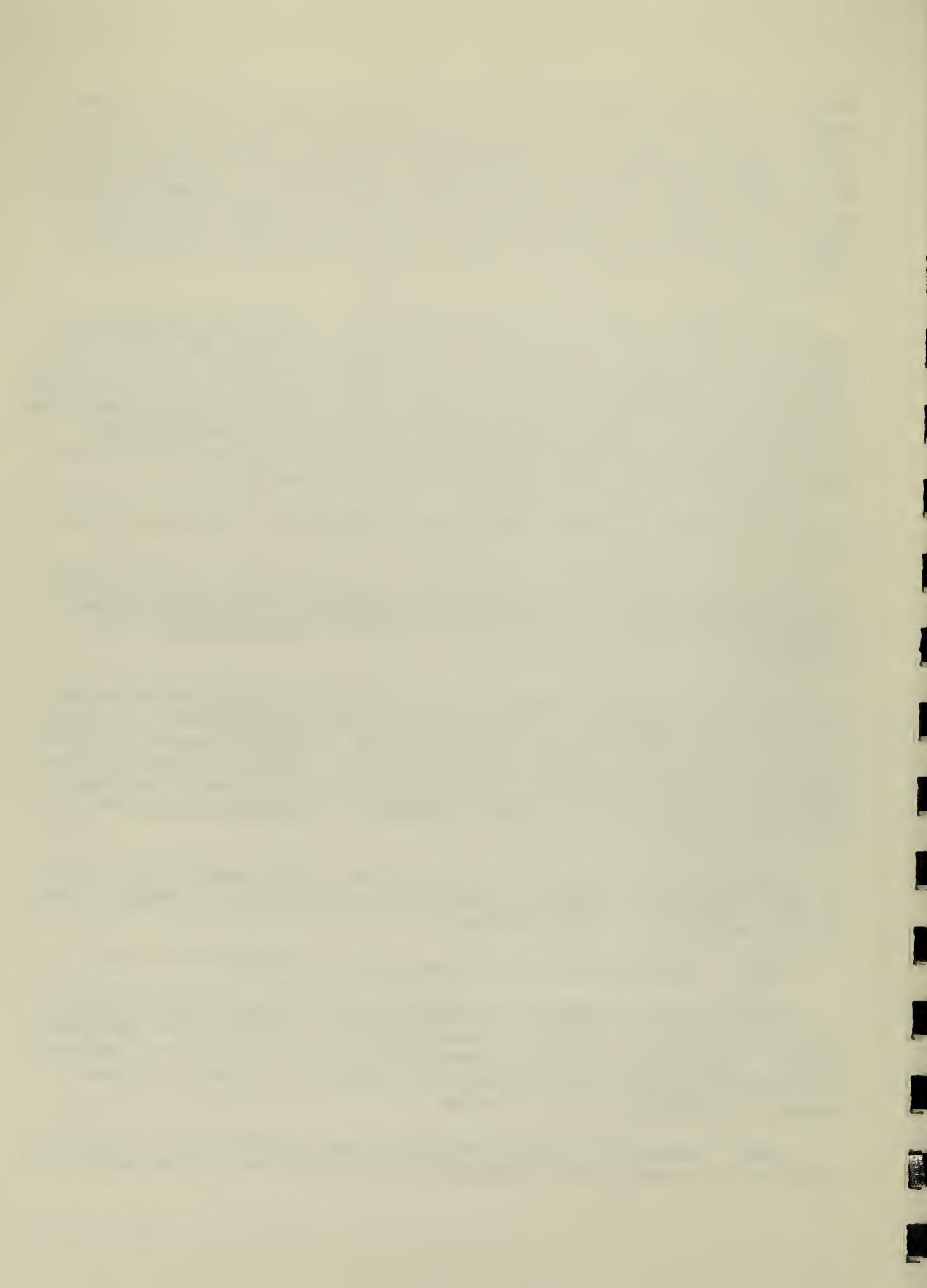
PARAPET. (See Fortification.) In field works, while the height is fixed at about seven feet, the thickness of the parapet varies according to the kind of fire it is intended to resist. Should the ground in front be inaccessible to artillery at 800 yards, the parapet is constructed of dimensions sufficient only to resist musketry, or from two to two and a half feet thick. To assist field-artillery, a thickness of from six to ten feet is required.

PASSAGES--are openings cut in the parapet of the covered way, close to the traverses, in order to continue the communication through all parts of the covered way. (See Traverse.)

PICKET. Sharp stakes used for securing the facines of a battery.

POSTERN or SALLY-PORT--is a passage usually vaulted, and constructed under the rampart, to afford a communication from the interior into the ditch. The passages from the covered way into the country, are likewise called sally-ports; as they afford free egress and ingress to troops, engaged in making a sally or sortie.

RAMP. A ramp is a road cut obliquely into or added to the interior slope of the rampart, as a communication from the town to the terre-plein.



RAMPART. A broad embankment or mass of earth which surrounds a fortified place, and forms the enceinte or body of the place. On its exterior edge the parapet is placed, while towards the place it is terminated by the interior slope of the rampart, on which ramps are made for the easy ascent of the troops and material.

RAVELIN--is the work constructed beyond the main ditch, opposite the curtain, composed of two faces, forming a salient angle, and two demi-gorges, formed by the counterscarp. It is separated from the covered way by a ditch which runs into the main ditch.

RAVELIN, (Redoubt of the)--is a work constructed within the ravelin, but separated from it by a ditch.

RAZED. Works or fortifications are said to be razed, when they are totally demolished.

REDOUBTS--are works inclosed on all sides of a square, polygonal, or circular figure. The latter form is rarely used, being unsuitable to ground in general, and from the impossibility of giving any flanking defence to the ditch. Redoubts on level ground are generally square or pentagonal.

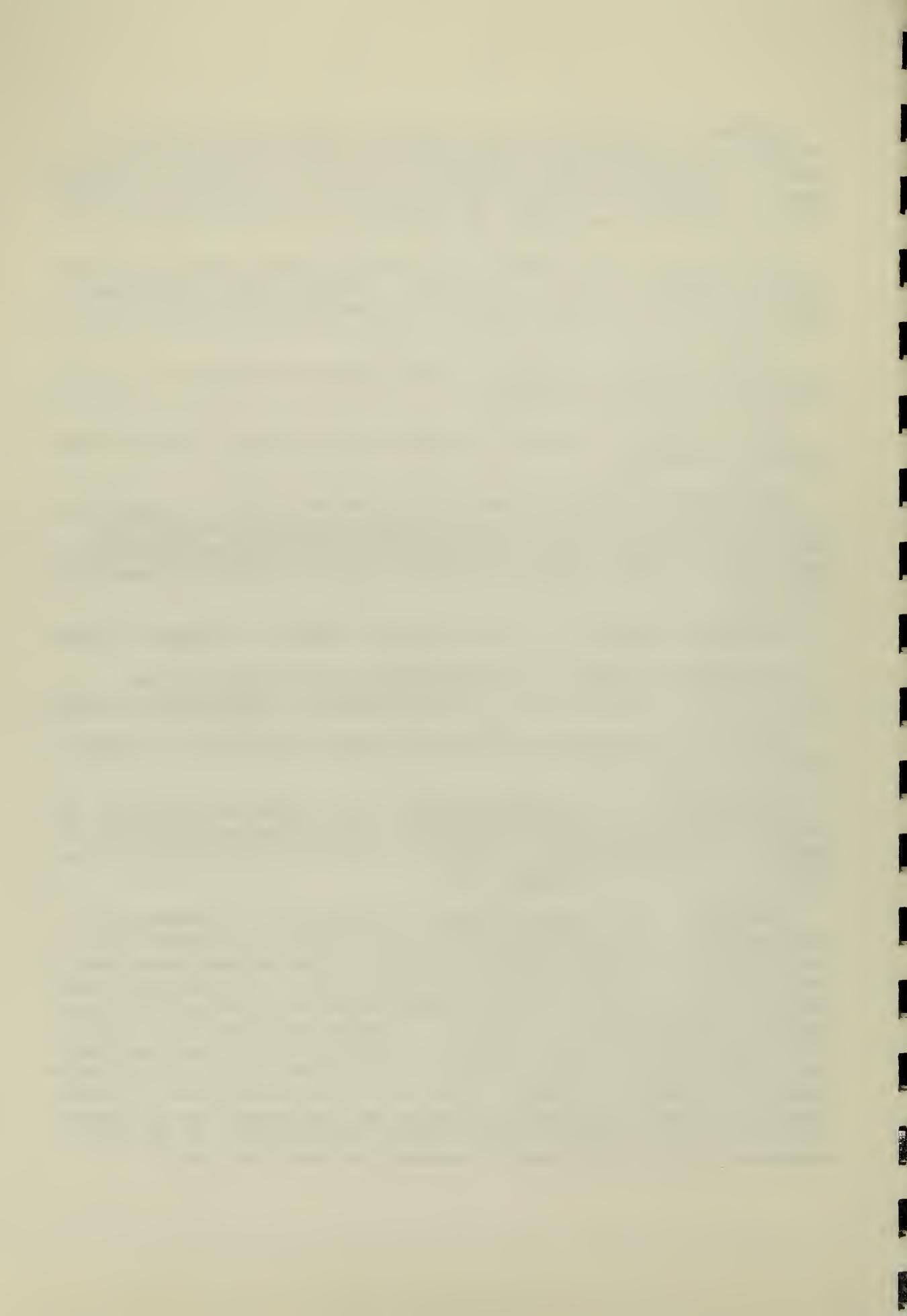
RE-ENTERING ANGLE--is an angle pointing inwards, or towards the work.

RE-ENTERING ANGLE OF THE COUNTERSCARP--is that formed by the intersection of the two lines of the counterscarp, opposite the curtain.

REMBLAIS--is the quantity of earth contained in the mass of rampart-parapet, and banquette.

RETRENCHMENT--is an inner defensible line, either constructed in the original design, or executed on the spur of the occasion, to cut off a breach, or other weak point; so that the capture of the latter shall not involve that of the retrenched post.

REVESTMENTS. The interior slopes of the parapets of permanent and field-works, as well as in some cases the sides of the ditches of the latter, require revetments to enable them to stand at that slope which is necessary, and to endure the action of the weather. The materials made use of in the construction of field-revetments are: fascines, gabions, hurdles, sod, sand-bags, and timber. In siege operations, and in fact in all operations in active warfare, vast quantities of these materials are required, and are daily consumed, in the construction of breastworks parapets, batteries, magazines, and a variety of miscellaneous purposes. Large quantities, then, must be prepared or manufactured by the ordinary troops of the line, superintended by their own officers, who should be acquainted with all the details necessary for their production.



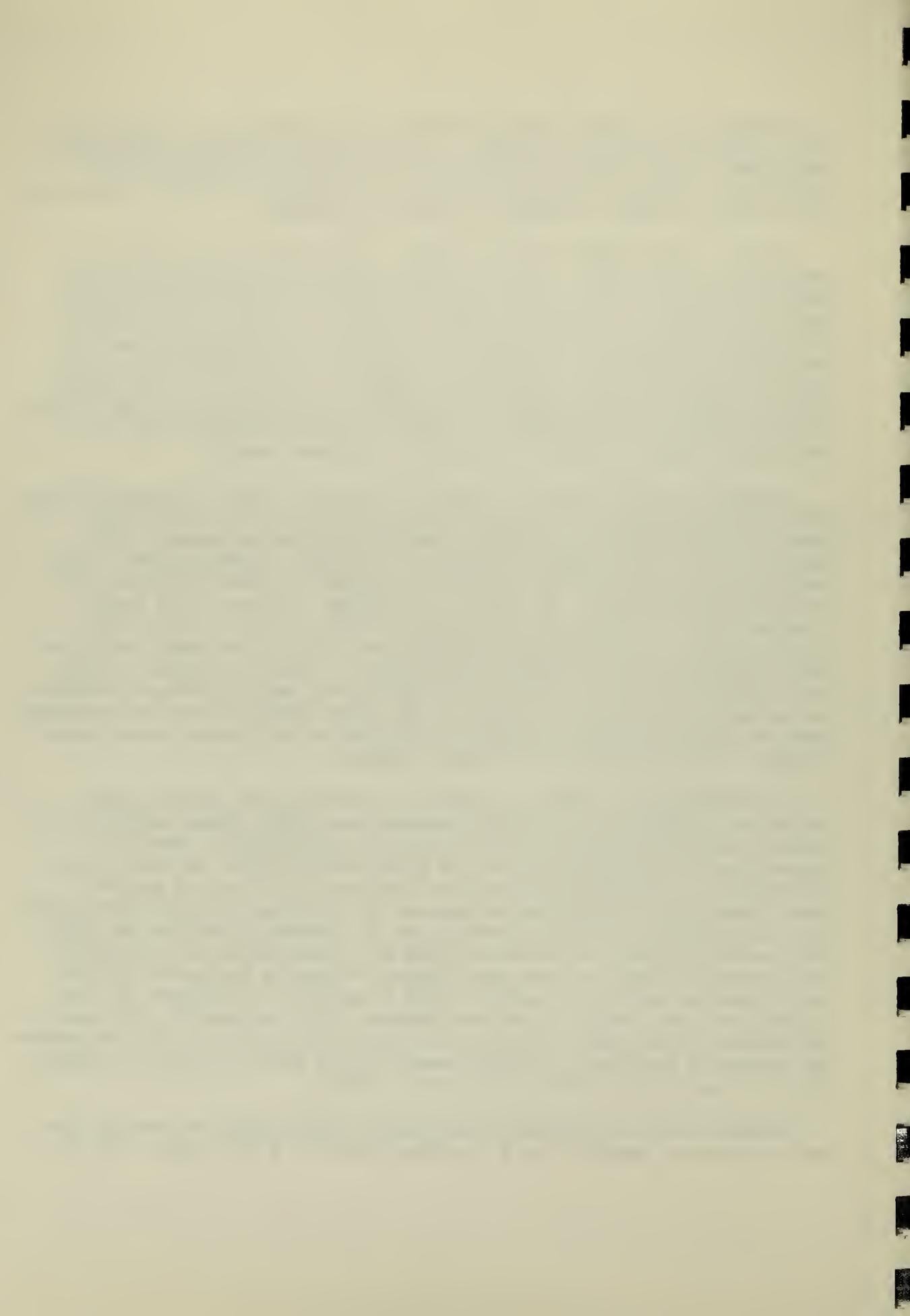
Fascines are strong, close, regular fagots, carefully and compactly made, generally of green brushwood. They should be straight, cylindrical, and pliant; bound round with good thick, unbroken gads or withes, of pliant wood, at equal distances, the knots well tied, and all in one line; no variation in girth exceeding 1 inch to be allowed.

Slopes, to be revetted with fascines, have usually a base equal to one-fourth their height. The fascines are placed horizontally one over another, as the work is built, until the whole slope is covered by one layer of fascines. Pickets are driven through each fascine to secure it to the work, and these are sometimes fastened to other pickets, buried vertically in the mass of parapet... To find the number of fascines required to revet any slope, divide the length of the slope by the length of the fascine, and the height of the slope by the diameter of the fascine, and the height of the slope by the diameter of the fascine: these two quotients multiplied together will be the requisite number.

Gabions are stout, rough, cylindrical baskets, open at top and bottom; they are made of various dimensions according to their intended use. Those for revetting the interior slopes of parapets are usually 3 feet high and 2 feet in diameter; strongly and somewhat coarsely made. Those used in sapping (called sap gabions) have about the same dimensions, but are carefully finished. To construct a gabion, a circle of 22 inches diameter must be traced on a clean, hard, level piece of ground, each quarter of this circle is then divided into four or five equal parts, and small holes made at the points of division, to receive straight uprights of 3-1/2 feet in length, around which the withes are interwoven. Gabions may be made with one, two, or three rods woven together about the uprights; when two rods are woven together, the work is called paring; when three, waling. The last gives the strongest gabions...

In revetting with gabions, a base is first made for them at right angles to the slope, so that when standing upon this, their surfaces will be coincident with the slope... When one row of gabions has been thus placed, and the parapet has risen as high as their upper surfaces, a row of fascines is laid horizontally upon the tops of the row of gabions. Above these again another row of gabions is placed at the same inclination with the former, and finally another row of fascines completes the whole. Two rows of gabions and two of fascines are required for the revetment of an interior slope, of the usual height, without a banquette, and one row of gabions and two of fascines with a banquette; therefore, in the former case, the number of gabions required, will be equal to the number of feet of crest to be revetted, and in the latter case to half that number. The number of fascines, in either case, will be equal to twice the length of the slope divided by the length of a fascine.

Hurdles...are the common coarse wicker hurdles made for farming, and other purposes, usually 3 or 4 feet high and 6 to 9 feet long. They are



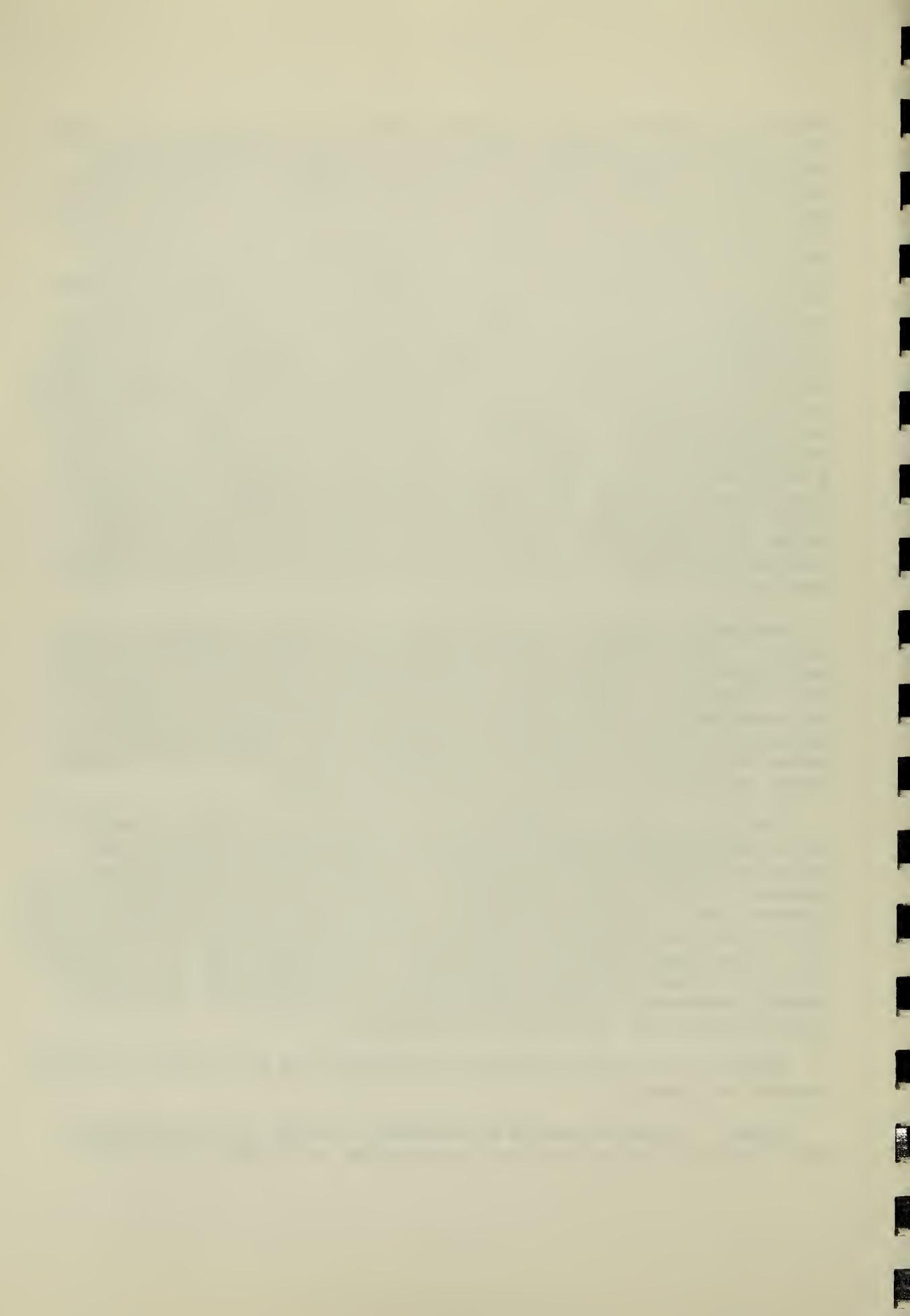
useful in temporary works, to retain earth at a steep slope, for a short time. When thus used, they should be secured by anchoring pickets. Hurdles are moreover useful, to form a dry footing in trenches, during wet weather; in the passage of wet ditches, and for many similar purposes. Sods or turfs are used for the formation of the interior slopes of parapets, and the checks of embrasures. Sods should be cut from fine close turf, with thickly matted roots, previously mown, and if possible, watered, to make the earth adhere more closely to the roots of the grass. The sods are laid, with the grass downwards, alternately headers and stretchers, like bricks in a wall. Their under or upper surfaces should be perpendicular to the slope of the parapet, and not horizontal, except in a vertical revetment, and each sod should be fastened to those beneath, by two or three wooden pegs. Sod work can be made with great perfection, and is very durable... In meadows, the dimensions of sods may be from 12 to 18 inches long, 12 inches wide, and 4 to 6 inches thick. In heath, having large roots, they may be 2 feet long, 12 or 18 inches wide, and 8 to 10 inches thick. To find the number of sods required to revet any given length of slope, the revetment being one sod thick: Divide the height of slope by thickness of sods, for the number of rows. Divide twice the length of the slope by the sum of the length and breadth of a sod for the number in one row. Multiply these two quotients together, for the whole.

Sand-bags are coarse canvas bags, of a capacity sufficient to hold about a bushel of earth; when empty they occupy only a small space, and are frequently of great use. A good field-revetment can be built with filled sand-bags, laid as sods; such a revetment, however, is only fit for temporary purposes, as the sand-bags soon rot; they are unfit for lining the checks of embrasures, as the flash of the guns speedily destroys them... Sand-bags are used in great numbers, laid on the superior slopes of parapets, to form loop-holes for riflemen.

Timber is used for revetments, in particular cases only, as where it may be considered advisable, in important field-works, to retain the escarp of the ditch at a steep slope. In this case, a revetment is necessary, which may be constructed of beams or the trunks of small trees, planted 3 or 4 feet deep, vertically in the ground and touching each other, or by lining the surface of the slope with planks secured by stout posts, 3 or 4 feet apart, planted several feet in the ground, and there fastened to heavy horizontal beams. The strength of the revetment may be still further increased, by connecting the upper extremities of the posts to others buried under the mass of the rampart;...

**SALIENT.** The salient angle of a fortification is an angle projecting towards the country.

**SALLY.** A sally or sortie is a movement made by strong detachments from a besieged place to attack the besiegers or destroy their works.



SALLY-PORTS. Openings to afford free egress to troops for a sortie. They are cut in the faces of the re-entering places of arms, and in the middle of the branches of the covered-ways. When sally-ports are not in use, they are closed by strongly constructed gates of timber supported by bars of iron.

SAND-BAGS. Bags filled with earth, usually from 12 to 14 inches wide, and about 30 inches long. They are employed sometimes in constructing batteries, and in repairing breaches and embrasures when damaged by the enemy's fire. (See Revetment)

TAMBOUR--is a stockade or timber wall, loopholed, made with two faces, forming a salient angle at the gorge of a work, to serve as a retrenchment or to cover the staircase, with a ditch in front, and sometimes with a half roof sloping to the rear, to protect the defenders from hand-grenades and splinters of shells...

TENAILLE--is a low work, constructed in the main ditch, upon the lines of defence, between the bastions, before the curtain, composed of two faces, and sometimes of two flanks and a small curtain.

TENAILLONS--are works sometimes found constructed in an old fortress, on each side of the ravelin--the short faces being traced, on the prolongations of the faces of the ravelin, from the counterscarp of its ditch; the long faces being directed for flanking defence, to about the middle of the faces of the bastions.

TERRE-PLEIN--is a name given to any space which is level, or nearly so; thus, the area on the rampart, between the banquette and the interior slope of the rampart, is called the terre-plein of the rampart.

TRAVERSES--are portions of parapets, which cross the breadth of the covered-way, at the salient and re-entering places of arms. Other traverses are also placed between these, where necessary, to afford proper protection. Traverses are thrown up, to bar enfilade fire, along any line of work or passage which is liable to it.



ILLUSTRATIONS



PRELIMINARY DRAWINGS



CHRONOLOGY OF PRIMARY SOURCE NARRATIVE REFERENCES TO

FORT MOULTRIE 1808 STORAGE MAGAZINE

"Brick magazine dry; designed to hold 500 bbls. powder."

December 10, 1811  
Eustis to Chever

"The Magazine is in a good state as to its protection from the weather, it being first shingled and then tiled; but is neither Bombproof nor fire-proof, the wooden roof showing itself under the eaves of the tile."

September 25, 1830;  
Memoir..., Lt. Mansfield

"The Magazine is in perfectly good order as far as the preservation of the powder is concerned; the roof being composed of tiles over wood. It, however, is not bomb-proof, and in case of an expected attack, it would be a prudent and proper measure to construct a temporary Bomb-proof Blindage ...around the magazine..."

January 22, 1835;  
Brown to Macomb

"The interior dimensions of the magazine at Fort Moultrie are as follows, viz:

length 28 ft.

breadth 15 ft.

height to Spring of arch 5 ft., 9 inches

height to key of arch 12 ft.

"It is not lined on the inside but is perfectly dry. It stands in a



recess in the centre of one of the bastions having several feet of clear space on all sides of it.

"It is not bomb-proof, the arch not being probably more than 20 inches thick. Above the arch is a roof of wood on which is laid a covering of tiles. This Magazine can conveniently hold 25,000 pounds of powder, or 250 barrels, piled 3 tiers high with sufficient room for passing around the piles. A temporary bomb-proof blindage might be constructed over the space around the Magazine, and it would be highly proper to do so if an attack were anticipated...

"There is at castle Pinckney 1 Magazines which have the following dimensions viz:

Length 17 ft. 1 inch

breadth next the Scarp wall 17 ft. 4 inches,

breadth next the parade 13 ft. 2 inches,

Mean breadth 15 ft. 3 inches.

Height to Springs of arches 2 ft. 6 inches

Height to key of arches 8 ft. 8 inches.

"Two circular arches at right angles intersect each other forming 4 groins running to the 4 angles of the room. This Magazine is [bomb] proof and is lined on the inside with wood. The principal entrance to it is directly from the Parade but there is a small passage through the Pier between it and the adjoining ordnance store room. During an attack the



opening from the Parade should be firmly walled up and the necessary communication had through the ordnance store room.

"This Magazine may contain conveniently pounds of powder or ? barrels piled 3 tiers high, with sufficient passages between the piles, and disposed so that the casks shall not touch the sides of the Magazine.

"The ordnance store room is bomb proof over head, but the closing wall next the parade is too thin to render it a perfectly safe place for depositing powder. This room is

? 2 inches long  
? 2 inches wide at one end &  
? inches at the other  
mean width 18 ft. 5 inches  
Height to Spring of arch 3 ft. 6"  
Height to key of arch 9 ft. 2 inches"

March 10, 1835;  
Bowman to Gratiot

"In reference to the magazines of both the works (Fort Moultrie and Castle Pinckney), the Department wishes information in detail, which may require plans and sections to convey fully - Their dimensions inside and outside - Is there a cellar? the dimensions thereof. Where are the Ventilators? their dimensions. The doors, windows, tc. and their dimensions - Is there a ceiling? Does the wood work mildew and decay? How can the ventilation be materially increased?"

April 30, 1839;  
Totten to Bowman



"...Plans and section of the Magazines at Fort Moultrie & Castle Pinckney are herewith submitted --- There are no cellars --- The Magazine at Castle Pinckney has been ceiled, but the ceiling has nearly all fallen, from the effect of moisture --- The wood in all southern magazines which I have ever seen, mildews and decays --- The greatest pains has been taken in the construction of Magazines, in the fortifications on the Gulf of Mexico - they have been lined with lead; covered with the same metal, built entirely with hydraulic cement, and lined with wood; and yet they do not preserve the powder from injury, owing to the condensation of moisture, from the warm air which is constantly brought in contact with the cold surface of the wall --- Two modes of preserving powder, in warm and humid climates, have suggested themselves to me, and are respectfully submitted.

"The first is in the mode of constructing the Magazine; this method has been tried, and promises success. -- Jn. 1829, the magazine at Fort Pike, was reported by the commanding officer, as too damp for the preservation of powder --- Upon examination it was found, that no lining, however carefully constructed, would produce the desired result --- as the only expedient, a wooden building was constructed within the casemate, a space of several inches being left between the inner building and the wall --- The wooden building was roofed and ceiled --- During the period of my service on the Gulf, I made occasional visits to this post, and have reason to think, that if the success of the experiment was not perfect, it was owing to defects in the construction of the inner building --- I would suggest to remedy these (in new works) that the number and size of the



ventilators be increased; that the walls of the outer building be placed at least eighteen inches from the sides of the outer one, and be made as tight as possible --- The second method consists of covering the Kegs, with Indian Rubber Cloth, or tin cases hermetically sealed, the air having been previously pumped out --- The covering or case to be put on, after the powder arrives at the Magazine, to prevent injury which the covering might sustain in transportation --- But little skill would be necessary to enclose the keg in either of these coverings, which I think, would effectually protect it, however damp the atmosphere, and at an expense comparatively small"

May 22, 1839;  
Bowman to Totten

"As to the Magazines of the two works (M & P) - they will be subject of future communication - in the meantime let me ask whether the joists of the floor rests immediately upon the ground - or what are the circumstances - thickness of floor, dimensions of joists, tc. tc. The drawings sent by you do not afford all the information desirable - for instance, are there means provided for hanging shutters both on the inside & outside of the window in the Fort Moultrie magazine - are there hooks, tc. are those at the doors, of iron or composition? What is the height of that window from the floor?"

June 12, 1839;  
Totten to Bowman

"...Owing to the quantity of powder, in the magazine at Fort Moultrie, I did not cause the floor to be taken up, to examine whether the joists rested upon the ground or were detached --- I have, since the receipt of



your letter, made the requisite examination, and find that the joist rest upon brick pillars elevated 15 inches; the joist are two feet apart; their dimensions 3" X 6" - the flooring 2" thick; the windows are 3'1-1/2" from the floor, and have shutters inside and outside - all the fastenings are composition..."

June 19, 1839;  
Bowman to Totten

"Your report of the 19th. inst. relative to the towers of Castle Pinckney & Magazine of Fort Moultrie, is at hand."

June 27, 1839;  
Totten to Bowman

"The Ordnance Department represent that they are in need of the magazine at Fort Moultrie, and I have to request that you will cause both that magazine and the one at Castle Pinckney to be prepared forthwith.

"The best way of preparing the inside of the magazines, is to line them with wood, keeping the lining at a considerable distance from the walls and piers - and I would recommend the following course to be pursued at both of your works - 1st clear out the cellar as low as the foundations will permit, or as low as can be done without admitting water - then lay the proper number of joists for the floor - 2d erect studs one foot from the wall (in the clear) and pass arched ribs over the top, at the same distance from the arch - upon these nail and lining one inch thick - concealing the nails in the joints - 3d lay the floor of 1-1/4 or 1-1/2 inch



stuff, keeping the edge of the floor half an inch from the side lining, in order that any moisture condensing on the sides may drop into the cellar - 4th leave openings in the linings opposite all the ventilators, and windows, [and] of their full size covering these [\_\_?\_\_] openings, on the inside of the walls or piers, with a copper or brass wire network, not finer than 1/4 of an inch mesh - 5th let the out side door - namely that in the wall or pier, be solid and strong - and place a lattice door (provided with a lock) at the entrance through the lining - 6th of course you will see that there are no leaks through the roof or arches, and that there are lightning conductors.

"As soon as the magazine at Fort Moultrie which should be first attended to is ready, you will please give notice thereof to the Ordnance Officer, in the harbor and allow him to take possession, should he desire to do so..."

November 9, 1840;  
Totten to Bowman

"The Magazine is finished."

March 19, 1841;  
Bowman to Totten

"I was much gratified by the good condition and police of this work, there are, however, a few small matters which should receive immediate attention, namely, the cutting off the Magazine doors, and raising the sills and floor of the entrance to the height of the floor within - the hanging of the shutter of the magazine window upon hinges and attaching



good fastenings thereto - then removing the shutters of the passages between the furring and the masonry, in order that the ventilators may never be interrupted."

June 2, 1841;  
Totten to Bowman

"...repairs of Fort Moultrie have been completed...the Magazine lined.---"

September 30, 1841;  
Bowman to Totten

"...making some very slight repairs to large magazine which is very dry and excellent; readjusting lightning-rod for protection of magazine;..."

March 31, 1855;  
Cullum to Totten

"Estimate of the cost of repairs of Fort Moultrie....

Scarping masonry of Magazine, re-pointing & grey washing..."

October 14, 1859;  
Foster to DeRussy

"At Fort Moultrie I have continued my heavy operations, and have employed one hundred and twenty men. The accessory defenses that I have created and am now perfecting are very important to the defense....They comprise, besides the works ordered by the Department,..."

December 13, 1860;  
Foster to DeRussy

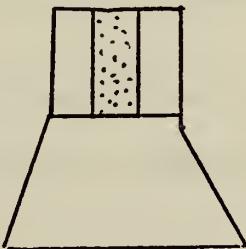
"I have the honor to report that I have made an examination of Old



Magazine at N. W. angle Ft. Moultrie, in accordance with letter of Instructions of General Gillmore of 8th inst.

"I find the measurements and references given on plan forwarded to this office (docketed 1X-62) to be in the main correct: the only material discrepancy being in the length of the first anteroom. This is given as 19' in plan: it measures 20'3":

"The section AB showing parade wall is incorrect, as showing the sand filling to run down to the ground, whereas it only extends to the top of the battering wall, thus: -



"Also, the plan does not show three 1-1/2" iron tie rods, running through the magazine proper and adjoining ante room from side to side, about 2'3" below the eaves line of the roof.

"The magazine and ante rooms are built of brick, and, with the exception of the first ante room (20'3" X 6'6") very badly laid up. The work is similar in character to that in the scarp wall. The bricks are of excellent quality, but the mortar (shell lime) is very poor, laid in very thick beds, and showing large interstices. The lining of the planks showed evidence of dampness, but the roof appeared good. It would be necessary however to strip it, to make a full examination.



"Although the work is of inferior character, yet the walls and arches are so heavy that I should judge they fulfilled the necessary conditions of stability. Probably the best way to render this magazine serviceable would be to spring a half arch from the parade wall (which surrounds the magazine on three sides) to the wall of the magazine, striking the same at a height of about 10' from the floor of the passage, and forming a continuous covered passage around the Magazine. The accompanying tracing No. 1 shows this arrangement. If, after stripping the top of Magazine, the roof should prove not to be in a satisfactory condition, it would probably require a concrete covering of greater or less thickness.

"The tracing No. 2 shows dimensions of postern. The brick work is of the same inferior character as the Magazine, with the exception of floor, which is well laid in cement.

"Tracing No. 3 shows the correct location of the magazine and postern in reference to fort. It differs slightly from that on general [?] plan, being rather farther to the North than is there shown.

"P.S. There are no stone sills, jambs nor lintels."

June 17, 1874;  
Gould to Cuyler

"In compliance with your letter of March 27th I enclose herewith a tracing showing the old storage magazine N. W. Angle Fort Moultrie, and giving the dimensions, form, height, of the arches in Magazine and ante-rooms, etc.



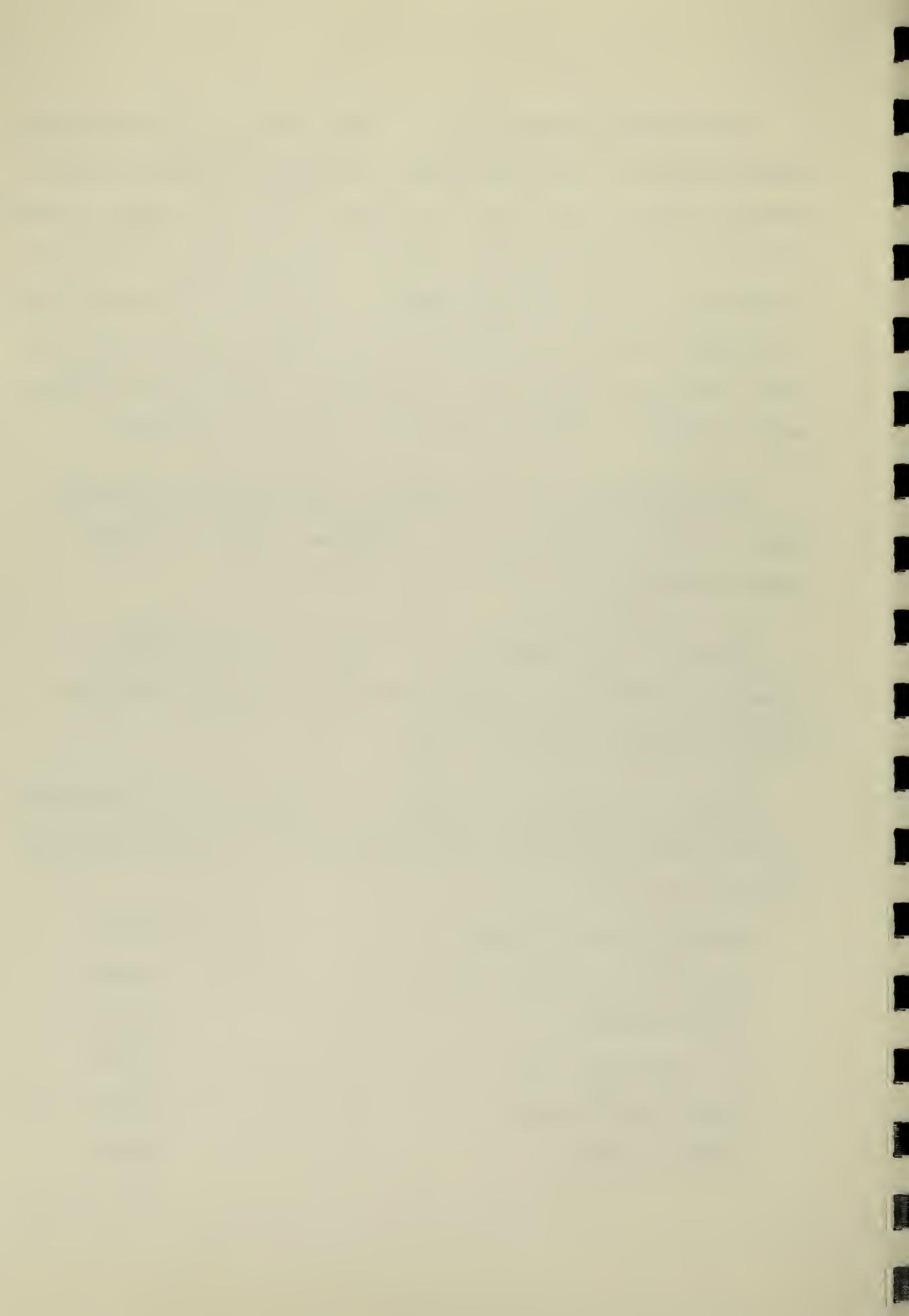
"The Magazine and ante-rooms are built of brick, laid in shell-lime mortar and appear to be in good order. Two cracks of considerable size have been discovered in the roof, one visible only on the inside and about 1/4 to 1/2 of an inch in width extends the entire length of the Magazine and 1st ante-room about one foot from the key course, the other about 1/4 of an inch in width is only visible on the exterior and is parallel and about 3 feet from the North end of the Magazine. Norwithstanding these there is no sign of leakage in either the magazine or ante-rooms.

"That portion of the walls enclosing the Magazine and ante-rooms, above the roof, is badly cracked, though these cracks do not extend below the springing lines.

"The part on the parade side of the 2nd ante-room and marked 'apparently solid' on the tracing, has been cut into some three feet without finding any trace of filling.

"The following project is respectfully submitted for the expenditure of the \$15,000 appropriated for Fort Moultrie S. C. for the fiscal year ending July 1st 1876

Remodeling Storage Magazine	\$2,200
Service Magazine N. W. Bastion	2,000
Platform Gun No. 12	4,000
B. H. Wall Gun No. 12	2,250
Completing bombproof	1,000
Torpedo Casemate	1,800



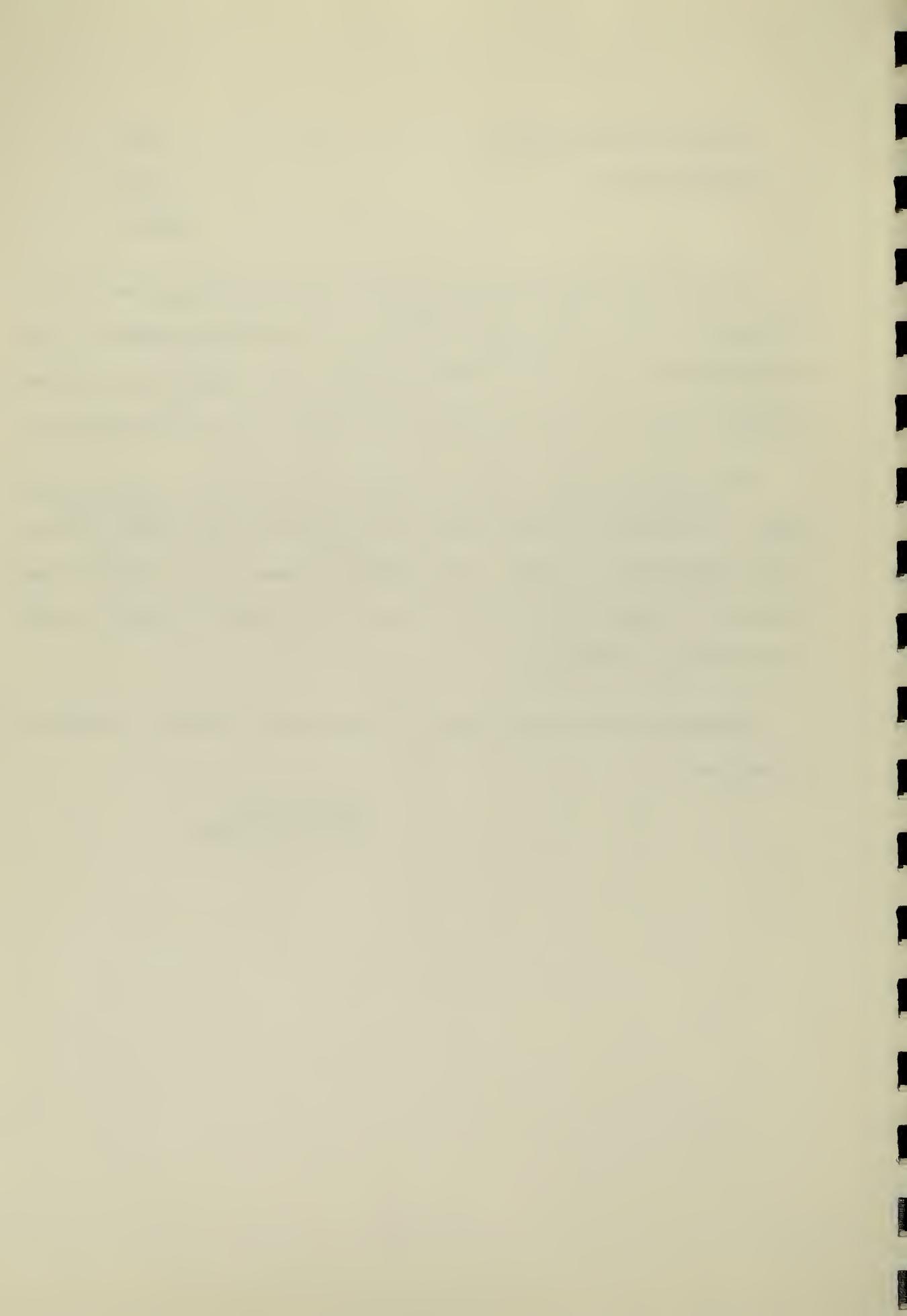
Passage ways to Postern	1,500
Magazine Doors	<u>250</u>
	\$15,000

"In making the estimate for remodeling the storage Magazine it was calculated to remove all of that portion of the side walls above the top of the Magazine, cover the roof with concrete one ft. thick, and arch over the open space around it, the arches to be made of 2 ft. thick concrete.

"The casemated torpedo room is estimated to be 15 ft. long and 8 ft. wide. At the close of the present season there will remain about 100 ft. of the bomb-proof unfinished. This would have been completed this season, had not Fort Moultrie been required to pay Fort Pulaski \$1,300. for platforms purchased last season.

"Estimating the working season at 7 months about \$2100 per month will be required."

May 22, 1875;  
Post to Gillmore



BUILDING CHRONOLOGY - FORT MOULTRIE, 1808-1887  
(Source: Edwin Bearss, Fort Moultrie, No. 3, 1968)

pg. 20 - April 1807 - Col. Williams advocated a 3-tier casemated work on Sullivan's Island.

pg. 17 - Nov. 20, 1807 - Secretary Dearborn to U. S. Senate  
\$750,000 needed to fund works to protect American ports and harbors against British attack.

At Charleston, still necessary for State Commissioners to designate the 4 sites to be ceded.

Dearborn called for projected fort on or near the "site of old Fort Moultrie."

pg. 18 - Nov. 24, 1807 - House Committee on Fortifications called for President to be authorized to cause forts to be built -

1807 (?) - Congress voted funds requested by Dearborn

Dec. 22, 1807 - Congress enacted Embargo Bill

pg. 19 - Jan. 28, 1808 - Dearborn directed Capt. Macomb to return to Charleston and push the work on the fortifications.

Feb. 3, 1808 - Macomb promoted to Major, Corps of Engineers.

Feb. 18, 1808 - Macomb returned to Charleston to begin the work.

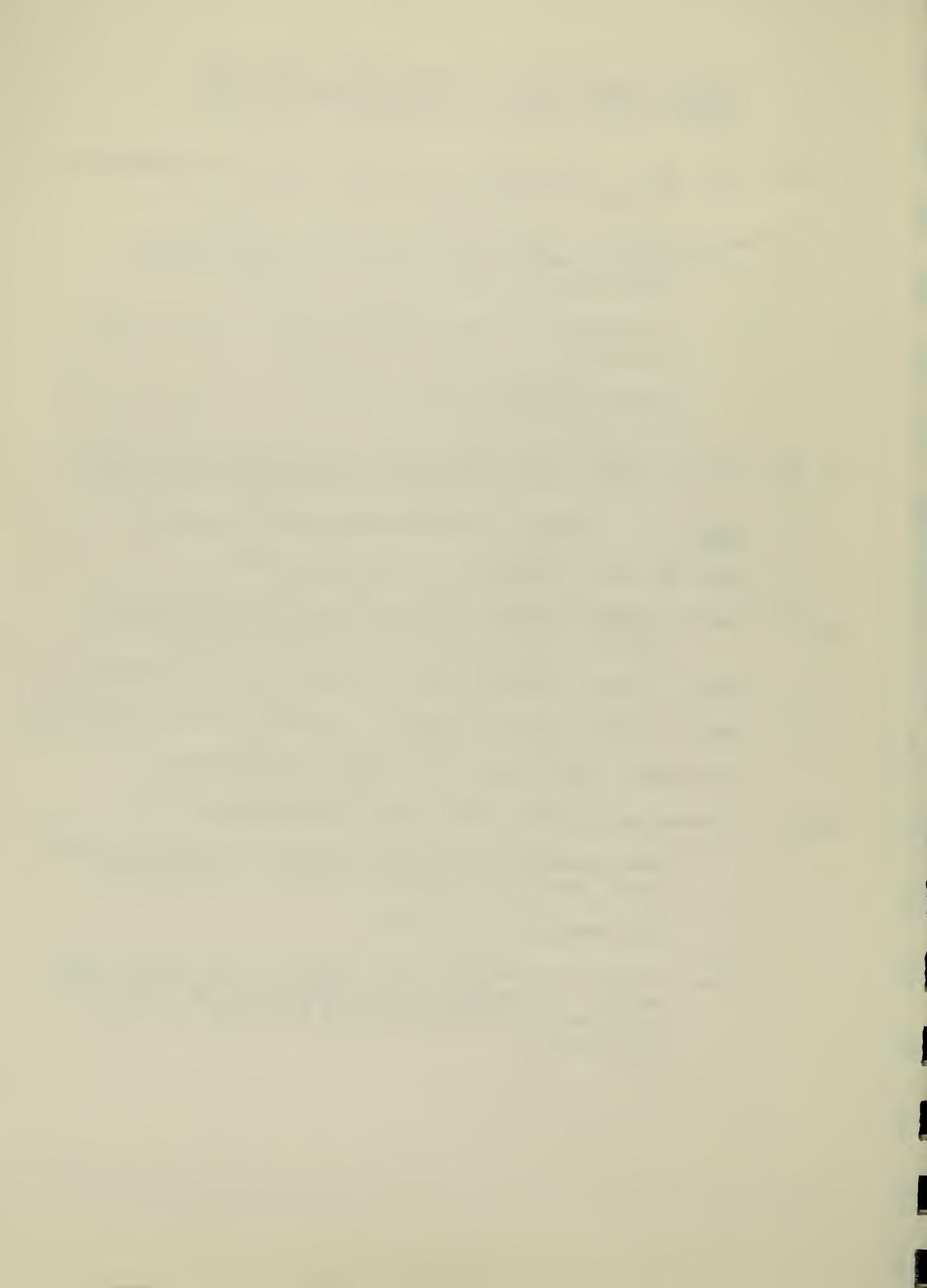
June 1808 - Plan Drawing of the Fort by Major Macomb

pg. 21 - June-August 10, 1808 - Work gangs made rapid progress.

Fort Moultrie II, barracks, officers' quarters and bakehouse razed and materials salvaged (also old walls)

Fort Moultrie III laid out

Aug. 10, 1808 - By this date the "whole of the interior and exterior revetment of the rampart" was "up to the three principal faces toward the sea and ready to receive the parapet."



Nov. 1, 1808 - By this date the Fort was enclosed, except for the gateway.

Nov. 1, 1808 - Macomb wrote to Dearborn:

This fort will be little inferior to any work in the U. States in point of magnitum & importance. It will mount on the sea side twenty pieces of heavy metal & contain a Garrison of 300 men.

Dec. 31, 1808 - By this date the gateway was scheduled for completion.

Jan. 6, 1809 - Moultrie enclosed and ready for garrison.

pg. 23 - Mar. 4, 1809 - Jas. Madison inaugurated as 4th President of the United States. Dr. Wm. Eustis replaced Dearborn as Secretary of War.

June 14, 1809 - Congress appropriated funds to complete the program for an adequate National Defense.

pg. 24 - Dec. 19, 1809 - Eustis to Congress: Moultrie - an enclosed work defended by bastions and batteries of masonry; designed for 30 guns, seven of which were mounted, with a brick magazine and barracks for two companies.

No other reports of 1809 extant; believed to have been burned by British capture of Washington - 1814.

On this date, Major Macomb turned Fort over to its garrison.

pg. 25 - Dec. 11, 1811 - Eustis to Congress - reported that Moultrie had an irregular form, was built of brick and presented "a battery of three sides on the seafront, and the whole is enclosed with ramparts, parapet, etc., mounting 40 guns."

The brick magazine was dry and designed to hold 500 barrels of powder.

Brick barracks and officers' quarters designed for 500 men.

pg. 26 - Apr. 28, 1812 - Macomb appointed by Eustis as Adjutant General of the Army.

pg. 26 - Feb. 1821 - Plan prepared by Poussin - Shows differences in Macomb's plan:



- 1) No ditch
- 2) No water-battery
- 3) Interior buildings differ slightly
- 4) 1827 - hot-shot furnace erected.

pps. 29-67

OFFICERS' QUARTERS AND BARRACKS, 1821-1856

pp. 34-35

Wooden drain to the Cove built:

Spring - 1825

Allotment of \$100 for lumber to build tunnels and drains to carry off the stagnant water.

pp. 97 - 124

CONSTRUCTIVE ACTIVITIES ON THE RESERVATION, 1825-1858

pg. 100 - July 1828 - Canal across parade was filled in.

pg. 40 - ca. Apr. 1829 - Fatigue parties of artillerists were set to yellow-wash the walls of the buildings and the exterior and interior.

pg. 42 -

Brick guardhouse (check 1830 plan - ca. 1835)

pg. 69 - Sep. 1830 (IMPROVEMENT) Lt. Jos. K. F. Mansfield prepared drawings. Purpose to ascertain improvements that might be required to render the Fort secure from escalade

pp. 69-70

(IMPROVEMENT) Mentions:

Scarp walls  
Land fronts - #1, 2 & 6  
Double course of two-inch planks  
Counterforts  
Right Bastion face, Front 6  
Bastion face, Front 2  
Embrasures  
Embrasure cheeks  
Tie walls  
Cover line wall  
Earth settlement  
Rotting plank  
Seafronts 3, 4 & 5  
Sentry boxes @ juncture of 1 & 2, 2 & 3,  
5 & 6, and 6 & 1.  
Salient angles  
Parapet  
Scarp-wall  
Parapet wall  
Parade rampart wall



Counterforts  
Pointing

pg. 70 (IMPROVEMENT) Engineer Board determined not to make any changes in Fort's configuration.

pp. 125-156 THE FIGHT TO PRESERVE THE SITE OF FORT MOULTRIE, 1831-1860

pg. 126 - Sep. 1830 - Mansfield: Moultrie was about 2 feet above high water except fronts 3, 4 and 5 where sand was banked up high.

At southwest angle only the remains of Fort Moultrie II prevented the sea from coming in contact with the wall.

Sep. 25, 1830 - Rec. palmetto log grillage and stone protec.

Aug. 16, 1830 - Gale threatened to undermine SW angle

pg. 127 - Mar. 4, 1831 - Lt. Henry Brewerton inst. to prepare estimate based on proposal by Mansfield.

pg. 130 - May 18, 1831 - Gale exposed plank grillage found at SE and SW angles; at the latter undermining part of grillage was decayed.

June 2, 1831 - Proposal to erect grillages and fill with rubble of Fort Moultrie II (not carried out).

pg. 131 - June 16, 1831 - ring tide "entirely removed the high bank of sand in front of Fort Moultrie and laid bare the foundation of the whole line of the work parallel to the shore, with about one-half of the faces of the adjacent bastions." i.e. - all of seafront now exposed.

pg. 131 - July 7, 1881 - Flood tide cause southwest angle to give way and settle "from 18 inches to 2 feet."

- Fractures in masonry occurred about 19 ft. from angle on front 4 and 25 ft. from left face of bastion on front 3.

pg. 132 - 130 cu. yds. displaced mass; \$1,000 estimated to rebuild.

Sep. 23, 1831 - By this date stone breakwater complete on sea-fronts - See Eliason Plan - 1833.

Apr. 11, 1832 - Recent high tide had bared a portion of the foundation of front 4, including the grillage, undercutting to a depth of two feet.



pg. 133 - June 1832 - Stone breakwater repaired.

pg. 134 - Sept. 1832 - 3 seafronts washed at every high tide.

Wall of main battery injured too greatly to admit of repair as the foundations were undermined and fractures were visible in the scarp "in every direction and breaches have been made in many places." At the southwest (?) angle the wall had been "thrown from its perpendicular and would no doubt...have been leveled to the beach, but for the temporary support given it by a deposit of stone made at its base."

pg. 136 - Winter 1832-1833 - Palmetto revetment for southwest angle and piers constructed.

pg. 70 - Nov. 8, 1832 - (IMPROVEMENT) Captain Wm. Eliason, Corps of Engineers arrives Charleston to supervise repair and construction.

pg. 71 Letter from General Gratiot directing him "to survey Fort Moultrie and cause it to be picketed."

"a line of palisades 8 feet high ... in advance of the 3 land fronts."

Southewst angle - displaced by encroachments of the sea (N.D.)

pg. 72 - Nov. 9, 1832 - (IMPROVEMENT) On SE face, sand hill (private property) suitable for battery of 4 guns.

Sea encroachment: "...whole gorge of the work between high and low water."

Problem with proposed pickets

Revetment of SW angle breached at distance of 123 feet.

pg. 73 - Nov. 10, 1832 (IMPROVEMENT) Bid proposals for timber for pickets and sea protection.

pg. 74 - SW angle - damaged scarp - plans to cover breach with revetment of "palmetto logs & pine timbers."

Dec. 30, 1832 - (IMPROVEMENT) Crew began building revetment of SW angle and setting pickets.



Feb. 19, 1833 - Palisade enclosing land fronts completed.  
Also SW angle revetment and projecting piers.

Mar. 1, 1833 - (IMPROVEMENT) Work completed:

Ramps to seafront gun platforms and NE Bastion  
Sally Port doors rebuilt  
Coping repaired  
Magazine repaired  
Guardhouse, cells and store repaired.

pg. 140 - Oct. 1834 - By this date new cribs erected and used stone of old breakwater (Eliason's of 1831)

[See Eliason Plan - 1833]

pg. 75 - Jan. 1835 - (IMPROVEMENT) Major General Alexander Macomb and Lieutenant T. L. Brown made study and found:

- 1) No hotshot furnace
- 2) 8 guns en Barbette mounted on the 3 seafronts
- 3) 3 land fronts in good condition
  - 1833 platforms and wooden banquettes were ready for service.
- 4) Wooden pitched roofs over sally port, guard-house, etc. rec. to be replaced with flat roof with parapet.
- 5) Magazine dry and in good order
  - Tile and wood roof.
- 6) Breakwater successful and fort again surrounded by dry land, necessitating need to extend palisade.
- 7) Suggestions for extension of palisade
- 8) Suggested 2 posterns (fronts 2 and 6) be bricked up and traverses be erected between palisade and scarp.
- 9) Parapet (breast-height) walls had been carried up "to the covering line." Suggested altering wall and height of covering line. [See Brown's plan - 1835 for proposed changes.]

pg. 78

Mar. 10, 1835 - Brown's study of Armament:

- 1) 16-24 pdrs. were mounted en barbette - on seafronts [?]
- 2) 2-32 pdrs. on truck carriages and 2-24 pdrs on field carriages were on elevated platforms enabling them to be served en barbette.



- 3) 3 land fronts: all sighted to fire en barbette
  - 2 - 24 pdrs on field carriages
  - 4 - 18 pdrs. on field carriages
  - 3 - 18 pdrs. on truck carriages
  - 2 - 8 in. howitzers on field carriages
  - 1 - 5-1/2 in. howitzer on field carriage
- 4) Flanking Seafront No. 4 - an 8 in. howitzer on a casemate carriage emplaced in SW angle revetment.
- 5) Principal Magazine:

Unlined, dry; positioned in the recess on the center of the NW Bastion - free standing

Not bomb-proof - arch not more than 20 in. thick

Roof above arch was shingles on which was laid a covering of tile.

CAPACITY: 25,000 lbs. powder or  
250 bbs. stacked 3 tiers high  
with passages around.

INTERIOR DIMENSIONS:

Length - 28 ft.  
Height - 15 ft. (5ft. 9 in to spring line) (12 ft. to key of arch)

pg. 80

6) Rampart Magazines (4)

pg. 43 - April 1835 - Buildings were yellow-washed: 50 lb. yellow ocre.

pg. 80 - Jan. 1836 - Garrison departed - Fort occupied only by Ord. Sgt.

pg. 44 - Jan. 1836 - Garrison leaves - fort left with only caretaker

Jan. - Feb. 1838 - Osceola and Seminoles imprisoned here.

1839 - 'The following year, 1839, the post was made the responsibility of the Corps of Engineers while it was undergoing extensive repair...' Fort used as quarters for artisans and laborers and for storage of supplies by Capt. Alexander H. Bowman..

pg. 80 - Jan. 1839 - Southwest salient angle revetment giving away.



pg. 81 - Feb. 3, 1839 - Revetment fell

Mar. 4, 1839 - Capt. A. H. Bowman arrived to take charge of work both on the fort and on the jetties.

pg. 82 - Apr. 22, 1839 - Bowman's estimate of work required:

1)	Rebuild masonry in breached wall	\$2,620.95
2)	Repair revetment of wall parapet	222.35
3)	Replace 1833 wood ramps with brick	374.54
4)	Replace gun traverses, pintle beds and blocks	6,168.26
5)	Replaster Officers' Qtrs. & barracks	1,391.90
6)	Build 4 pair sally port gates, 4 " barrack steps 5 " window blinds & Misc.	516.50
7)	Painting	592.30
		<u>\$13,075.08</u>

[NOTE: This stated to be Appendix A - not there.]

- Barbette guns found to be mounted without traverses or permanent pintle blocks. Some were mounted on wooden platforms; others on stone. None possessed traverse circles.

Stone platforms were flagstones.

For armament in 1839 see footnote 18 - this page.

pg. 146 - July 1839 - See foot note #37 - retracing foundations of Fort Moultrie II - Grillage #5 crossed these foundations.

pg. 84 - Mid-Oct. 1839

Breached scarpwall rebuilt  
Wood ramps replaced with brick  
Quarters replastered and painted.

Dec. 1840 - Gun platforms completed.

pg. 85 - Oct. 21, 1840 - Repairs completed:

1)	Carpentry (repair of quarters making and hanging main gates and Sally Port Doors and repair of implements)	285.80
2)	Blacksmith (traverse circles, pintle blocks, sharpening drills and stone-cutting tools)	514.00



3) Masonry (coping and repair of parapet walls, placing terreplein flagstones and cutting same to receive traverse circles and pintle blocks, paving ramps, repairing cisterns, coping furnace and making and repairing drains	1,091.90
4) Plumbers (repairing gutters and downspouts, and soldering roofs)	22.71
5) Parapets leveled and sodded	

pg. 86 - Mar. 19, 1841 - MAGAZINE - examination had shown:

- 1) Floor joists rested on brick piers
- 2) Joints (3 X 6 in.) were 2 ft. apart
- 3) Flooring was 2 in. planking
- 4) Windows were 3 ft. 2-1/2 in. from floor  
and were shuttered inside and out.  
Fastenings were composition.

- By this date:

- 1) New flooring installed
- 2) Damp-proofed by addition of a new lining

- Mar. 31, 1841 - Fort ready for armament.

1842 - without a garrison until this year. (Jan.-Feb.  
1838 occupied by Oceola, etc.)

pg. 87 - Mar. 1842 - Parapet shingled and sodded  
Barracks whitewashed.

pg. 87 - Total funds expended for 3 years work: \$11,801.25

pp. 88-89 - Pintle problems

pg. 45 - June 24, 1842 - Col. Gates and Companies I & G occupied fort

pg. 46 - July 27, 1842 - Co. D. also occupies fort.

pg. 47 - Apr. 5, 1842 - Co. E. occupies fort

Fall 1842 - Hurricane

pg. 48 - July 23, 1843 - All buildings within fort covered with slate



pg. 49 - Guardhouse, again

pg. 53 - June 26, 1845 - Bragg's company departs for New Orleans and Texas  
Aug. 27, 1845 - Co. A. transfers in  
Sep. 1845 - Co. A. and Co. I departed for Texas.

pg. 89 - 1845-1846 - Timber banquettees on 3 seafronts built.  
- Repairs to parapet shingling  
- Repointed brick gun platforms

pg. 54 - Feb. 1847 - Co. K. leaves  
- from this point on, fort occupied only by volunteers staging for Texas.

pg. 89 - Nov. 18, 1847 - Fort in good condition. No work done for past year - none projected.

pg. 57 - Feb. 4, 1848 - Volunteers had greatly damaged Fort including destroying nearly "all the public fence."

pg. 58 - Oct. 23, 1848 - Companies F and I arrive

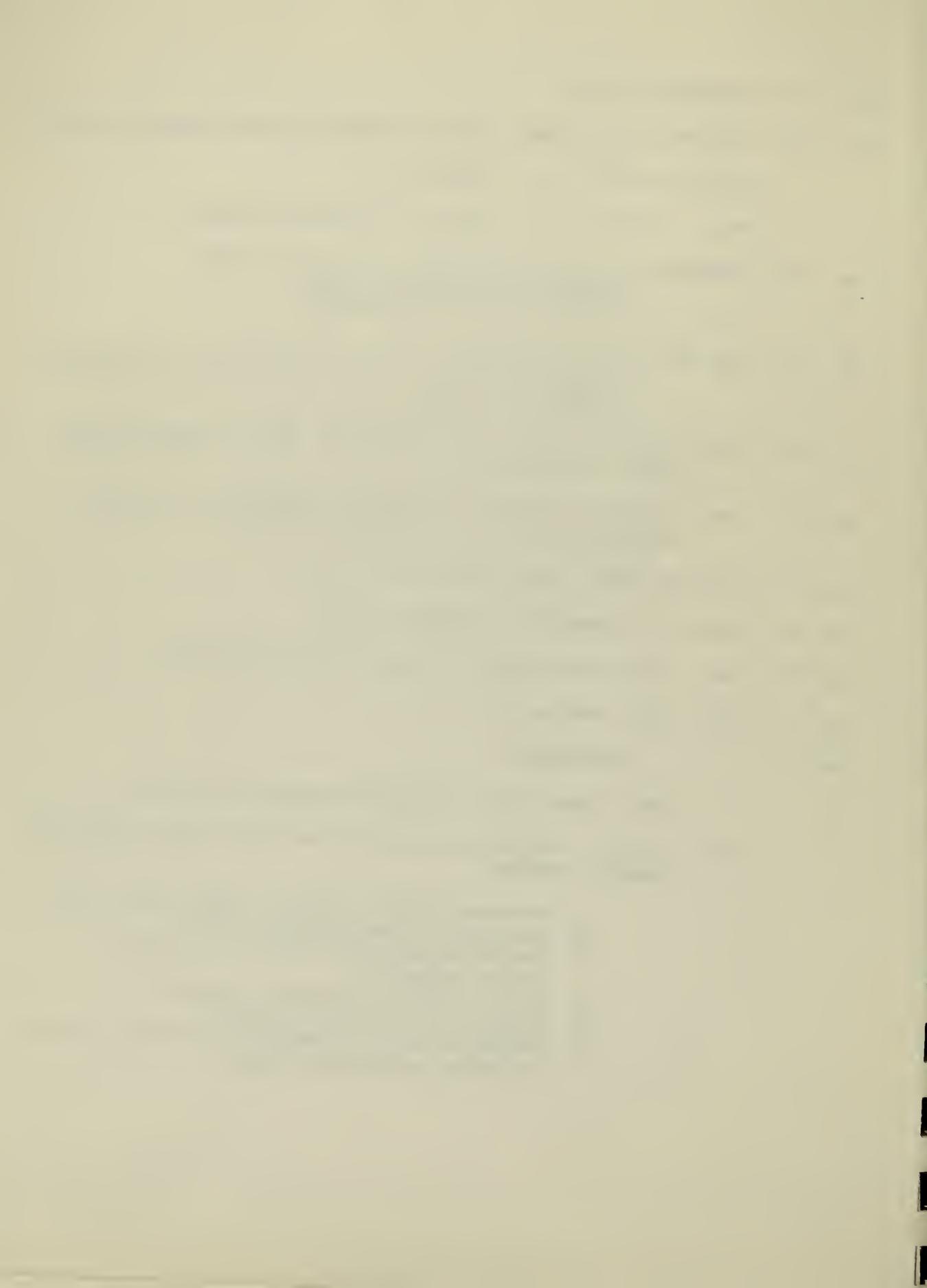
pg. 59 - May 1853 - Companies E, K and M arrive

pg. 90 - May 2, 1854 - Rec. made to drain reservation parade.

pg. 62 - Sep. 1854 - Hurricane

pg. 64                   Guardhouse  
1855 - Capt. Geo. W. Cullem assigned to Charleston  
Mar. 31, 1855 - Cullum inspection found Fort in good conditions.  
Repairs required:

- 1) Renewing shingled interior slopes (now rotted)
- 2) Securing loosened traverse circles
- 3) Installing new doors and floors to the 6 service magazines.
- 4) Slight repairs to principal magazine
- 5) Readjusting principal magazine
- 6) Rehanging inner and outer main posterns, gates, replacing missing fastenings.



- 7) Relaying a few pieces of coping and pointing the whole.
- 8) Perfecting the drainage of the entire Fort, which was bad.
- 9) Proposed bricking up east and west posterns
- 10) Proposed hot-shot furnace.
- 11) Dunes on seafronts needed leveling (within 2 ft. of parapet top at southeast corner)

Summer 1855 to Oct. 1, 1855 - Cullum had:

- 1) Replaced the "decayed interior shingled slope of parapet..." with a thin brick wall
- 2) Replaced service magazine doors
- 3) Elevated and graded interior parade ground
- 4) Enlarged the drains
- 5) Paved and graded passages in rear of quarters
- 6) Erected brick cistern with gutters on reservation
- 7) Attended to Fort's general upkeep.

pg. 92 - Feb. 1856 - Hot shot furnace completed

- No further work until 1857

pg. 93 - Granite columbiad platforms

Apr. 28, 1858 - By this date gun platforms on channel front torn out and 5 new granite columbiad platforms completed including the breast-high wall recesses

pg. 94 By this date also, Lt. Jas. G. Foster took command.

Aug. 19, 1858 - By this date all 10 platforms completed.

pp. 94 - 95 Pintle problems

pp. 95 - 96

Oct. 14, 1859 - By this date:

- 1) Main gates were rehung
- 2) Area near the magazine door drained
- 3) Pavement in front of main postern repaired.
- 4) Surface of artillery ramps graded.
- 5) Surface drains of parade cleared.

pg. 67 - Dec. 26, 1860 - Post evacuated



pp. 157 - 179: THE CIVIL WAR PERIOD - 1860 - 1872

pg. 158            1860 - Doubleday recalled in 1876 that the walls were 12 ft. high, old and weak and full of cracks. Dunes built up to top of walls.

Sep. 1860 - Lt. Foster ordered the repair fort and put it in order. \$8,500 appropriated.

pg. 159 - Sep. 12, 1860 - Fatigue party begins removing dunes and building a permanent glacis.

Dune had overtopped the parapet

Southwest angle excavated to ditch bottom in preparation for construction of a flanking caponnier.

Guardhouse.

The sharp angles of brick at the salients of the scarp, which had been broken and notched, were cut off and repointed.

pg. 160 - Nov. 1, 1860 - By this date a postern from interior at the southwest angle was opened to the flanking caponniere.

another being cut to caponniere under construction at the southeast angle.

pg. 161 - Nov. 11, 1860 - Posterns completed but not covered

Temp. flanking arrangements made.

Armament consisted of:

45 pieces of heavy ordnance mounted on superior slope -  
1) 10 - 8 in. columbiads  
2) 16 - 24 pdrs.  
3) 19 - 32 "

Also were:

- 1) 1 - 10 in. seacoast mortar
- 2) 4 - 6 pdr. brass guns
- 3) 6 - howitzers (2-12 pdrs and 4 - 24 pdrs.)

pg. 161 - Nov. 18, 1860 - Fort in readiness; guns emplaced and loaded.



pg. 162 - Nov. 1860 - Masons employed in:

- 1) Southeast postern leading to caponniere and relaying coping.
- 2) Building 5 gun platforms and banquettes and connecting same.
- 3) Const. banquettes, loopholes and embrasures in southwest brick caponnier.
- 4) At northwest salient angle, cut through parapet, enlarged the angle, raised vertical walls on the foundation of the scarp to form a bastionet for musketry and relaid coping.

Dec. 4, 1860 - Northwest Bastionet completed except for embrasures  
East and west curtain Posterns bricked up.  
Crew set to work on a wet ditch around the Fort  
"...which, although necessarily shallow from the  
quicksand, will more than double the difficulty of  
scaling the walls."

pg. 163 - Dec. 13, 1860 -Wet ditch 15 ft. wide (not very deep because of  
quicksand)

Picket fence fronting ditch

Glacis

Machicouli gallery, southeast angle

Cement barrels used as merlons, southeast angle

Dec 20, 1860 -Wet ditch now completed

East front raised and guns provided with siege-  
battery embrasures faced with hides; heavy merlons  
and strong traverser (to prevent enfilading fire)

pg. 164 - Dec. 26, 1860 - Garrison transfers to Fort Sumter

Dec. 27, 1860 - Gun carriages at southwest angle which bore on  
Fort Sumter were destroyed.

[see Plate XXI - view of this taken from  
Harpers', Jan. 19, 1861]

pg. 165 - Jan. 1866 200-man negro work gang:

1st project was to erect 3 large traverses on the east  
half of the seafront and an enlargement of one built  
by Foster on the face near the south angle.

Merlons of timber, sand-bags and earth erected between  
all guns, on the southwest front facing Fort Sumter .

Traverses and merlons erected on sea front to protect  
from enfilading fire.



pg. 166 - Jan. 21, 1861 - Lt. Foster's observation and description of Fort Moultrie's merlons.

Feb. 22, 1861 - Negro work gangs threw up earth parapet in front of scarp at southwest seafront.

Side next to scarp revetted with barrels, with exterior slope facing FOSU being "pretty steep."

Apr. 1861 - By this date a number of the big guns transferred to other works.

pg. 166 - Apr. 12-13, 1861 - Bombardment of Fort Sumter

Fort Moultrie had 30 guns in place:

- 1) 3 - 8 in. columbiads
- 2) 2 - 32 pdrs.
- 3) 6 - 24 " were all pointed at FOSU

pg. 167 Fort Moultrie quarters and barracks heavily damaged; also hot-shot furnace

pg. 168- 1863 Armament as of Sept. 22, 1862 and Apr. 7, 1863

pg. 170 - July 1863 - Armament - 10 in. columbiad mounted

pg. 171 - Aug 18, 1863 - Parts of quarters razed

Study initiated to determine new traverses required  
Fort now began to be turned into an earthwork.

pg. 173 - Sep. 7, 1863 - Quarters further damaged.

pg. 174 - Sep. 12, 1863 - Quarters razed.

pg. 175 - Oct. 30, 1863 - Ordnance

pg. 176 - Apr. 1864 - Further changes by this date:

- 1) Mortar battery on the east needed repair
- 2) Officers' bombproof in east curtain nearly completed; needed to be sodded.
- 3) Eastern gallery completed
- 4) Western gallery and bombproof completed and magazine reinforced
- 5) Bombproof gallery being constructed outside west front
- 6) Western mortar batteries dilapidated and in need of work.



## 7) Armament listed; inc:

Southwest Face

Gun #8) 8 inch rifle; barbette; good cond.  
 Gun #9) 10 inch columbiad; " " "

Northwest Half-Bastion

Gun #10) 24 pdr. smoothbore; barbette; fair  
 Gun #11) 24 " " " "

[#10 fired N & # 11 fired E.]

Feb. 17, 1865 - Confederates evacuate Moultrie

pp. 181 - 218

THE 1872 - 1876 MODERINZATION

pg. 181 - Autumn 1865 - Chas. R. Suter, Chief Eng., Dept. of the South - made study of Moultrie  
 Sally port greatly damaged  
 Breast-height wall of gorge greatly damaged.  
 Armament listed

pg. 187 - Feb. 5, 1872- Masons began work

By end of month the following accomplished:

pg. 189

- 1) South, SE and 1/2 of SW faces of the terreplein cleaned off
- 2) Breast-height walls of above faces torn down
- 3) Palmetto cribs (2) and traverse torn down
- 4) Pintle platforms dismantled
- 5) 2 wooden bombproofs removed from S. wall
- 6) 1 " " " " W. face  
     (bombproofs covered by 14 ft. fill)
- 7) 200 cartloads of rubble removed
- 8) 14,000 brickbats salvaged
- 9) 3 cartways cut through south scarp wall  
     to level of terreplein.
- 10) Obsolete Civil War guns removed and sold
- 11) New Ordnance received (list of -)

pg. 190

Mar. 1872 - Work completed this month:

- 1) Remainder of gun platforms, breast-height wall and terreplein flagging (except for N. face) removed to reservation.
- 2) Large bombproof (under 14 ft. earth cover), against west parade wall was removed
- 3) Small bombproof covering ent. to W. postern removed.



pg. 191

- 4) Foundations of west barracks excavated and removed
- 5) Main Magazine entrance exposed
- 6) Large bombproof against curtain and South flank of east face removed.
- 7) Scarp-wall excavated to depth of 4 ft. and "prepared for the masons"
- 8) 40,000 bricks salvaged.
- 9) 175 cu. yds. brickbats broken for concrete.
- 10) 2,000 cart loads debris hauled out
- 11) Gun positions 2 thru 11 readied for new platforms

Mar. 30, 1872 - Description of brick work of 1807-1809 scarp-wall brick work

pg. 192

Decision made to place new 15 in. Rodmans at positions 5-8.

Parade-wall brick and oyster shell for concrete.

Apr. 1872

During month the following completed:

- 1) Scarp wall repaired (73,500 brick laid) (as soon as coping restored, it would be at its former reference - 12 ft.)
- 2) Parade wall removed as well as cisterns, ramps, parapets and tie walls in the terreplein
- 3) South face service magazine nearly completed...
- 4) Concrete foundations for wooden platforms of the 15 in. Rodmans, Guns 7 & 8, poured.
- 5) Excavations completed for Service Mags. in southeast and southwest angles
- 6) Principal Mag. uncovered
- 7) Fill for the new terreplein and parapet in the SE, S, and SW faces begun.

pg. 193 - May 1872 - Work completed this month:

- 1) Front of scarp-wall, south face, excavated to greater depth exposing two large breaches.
- 2) Breaches repaired - masons torn out and relaid 27,000 brick
- 3) South Magazine completed
- 4) Gun Platforms 7 and 8 completed
- 5) Foundation for southeast magazine laid
- 6) Work continued on terreplein and parapet on the 3 seafronts
- 7) In the North face the half-parade, the walls and a cistern were removed.
- 8) 200,000 brick reclaimed from private person



- 2) Revetment of breast-height walls of gun positions  
    7 and 8
- 3) Southwest caponniere razed
- 4) Interior southeast Magazine plastered
- 5) Filling up parapet, south face con't
- 6) Covering Magazines con't.
- 7) More brick brought in

pg. 198 - Feb. 1873 - Work completed this month:

- 1) Principal Magazine, con't.
- 2) Southeast face Magazine and connecting galleries  
    con't.
- 3) Breast-height wall revetment of guns 5 and 6
- 4) Southeast and southwest Magazine cover inc.

Mar. 1873 - Work completed this month:

- 1) 306 yds. concrete poured as walls of principal,  
    and service mags. and galleries raised from  
    ref. 6-6/11 to 13
- 2) 206 cu. yds. sand raised parapets between southwest  
    angle and south face magazine from  
    ref. 14 to 15
- 3) 41 blocks artificial stone coping manufactured  
    for scarp

Apr. 1873 - Work completed this month:

- 1) Concrete work for principal and service magazines  
    and adjoining galleries
- 2) Southeast angle Service Magazine - added 300  
    cu. yds. sand

pp 198-200                                  - Re-sod to hold sand

pg. 201 - May 1873 - Work completed:

- 1) Principal and Service magazines and galleries  
    plastered on outside.
- 2) 200 cu. yds. sand added to southeast magazine

June 1873 - Work completed:

- 1) Sand cover on principal and service magazines  
    razed from ref. 0 to 5 by 400 cu. yds. sand
- 2) Scarp-wall of SE angle and S. face raised from  
    ref. 11-6/ to 12-6/ with 17,000 bricks.
- 3) 750 lin. ft. artf. stu. coping for land fronts  
    was made



pg. 202 - July 24, 1873. - Brick coping on the three seafronts completed

Oct. 1873 - Work completed:

- 1) Terreplein and slopes in rear of Guns 5, 7, 8 and 9 completed and graded
- 2) South Magazine sand cover completed
- 3) Sand con't. on principal and service Magazines

pg. 203 - Oct. 29, 1873 - Northeast Bastion Magazine

19 cu. yds earth excavated  
Foundation land  
Bastion terreplein raised from ref. 7 to 12  
Principal Mag.: raised fill to ref. 21  
NW Bastion: raised scarp wall from ref. 11.6  
to 13 (1.5 ft.)  
East face: Removed 145 cu. ft. of old breast-  
height wall and sally port (postern).

pg. 204 - Dec. 1873 - Ordnance mounted - list of:

- By end of month:

- 1) Northeast Bastion terreplein raised from ref. 7 to 12 with 350 cu. yds. fill
- 2) Scarp-wall of north face of curtain, bricks raised ref. from 11-6 to 13 (1.5 ft.)
- 3) Northeast Magazine, ref. raised from 5-6 to 21-6 with concrete thereby completing it.

pg. 205 - Jan. 1874 - Sand cover of two Service Magazines ready for sodding

Feb. 1874

- 1) Northeast Bastion - gun platform excavated ready for concrete; gun #1
- 2) Cover of northeast and east Service Magazines raised from 10' to 14'
- 3) Brownstone coping and caps on wing walls of northeast magazine positioned
- 4) Brickwork of scarp-wall raised 11'6" to 13' (1.5 ft.)
- 5) 75 ft. art. stn. coping laid on scarp wall NE bastion completing coping across front from NW bastion with exception of Sally port.
- 6) Bombproof galleries completed from the gallery of the main and the service magazines to the sally port and raised from 0' to 5'6" for 20 ft. beyond (west bombproof)
- 7) Sally port gallery raised from 0 to 5'6" from the bombproof gallery to parade exit



March 1874 - Leak in Principal Magazine  
Breast-height wall of Gun 1 laid - completed in April and concrete poured for emplacement.

pg. 206 - Apr. 1874 - Foundations and breast-height walls being excavated for Guns 2, 3, 4, 9, 10 and 11  
Concrete poured for foundations for platforms and breast-height walls, Guns 10 and 11

Apr. 27, 1874 - By this date:

- 1) Sally port and opes. in scarp-wall of south and west fronts bricked up

pp. 206-207

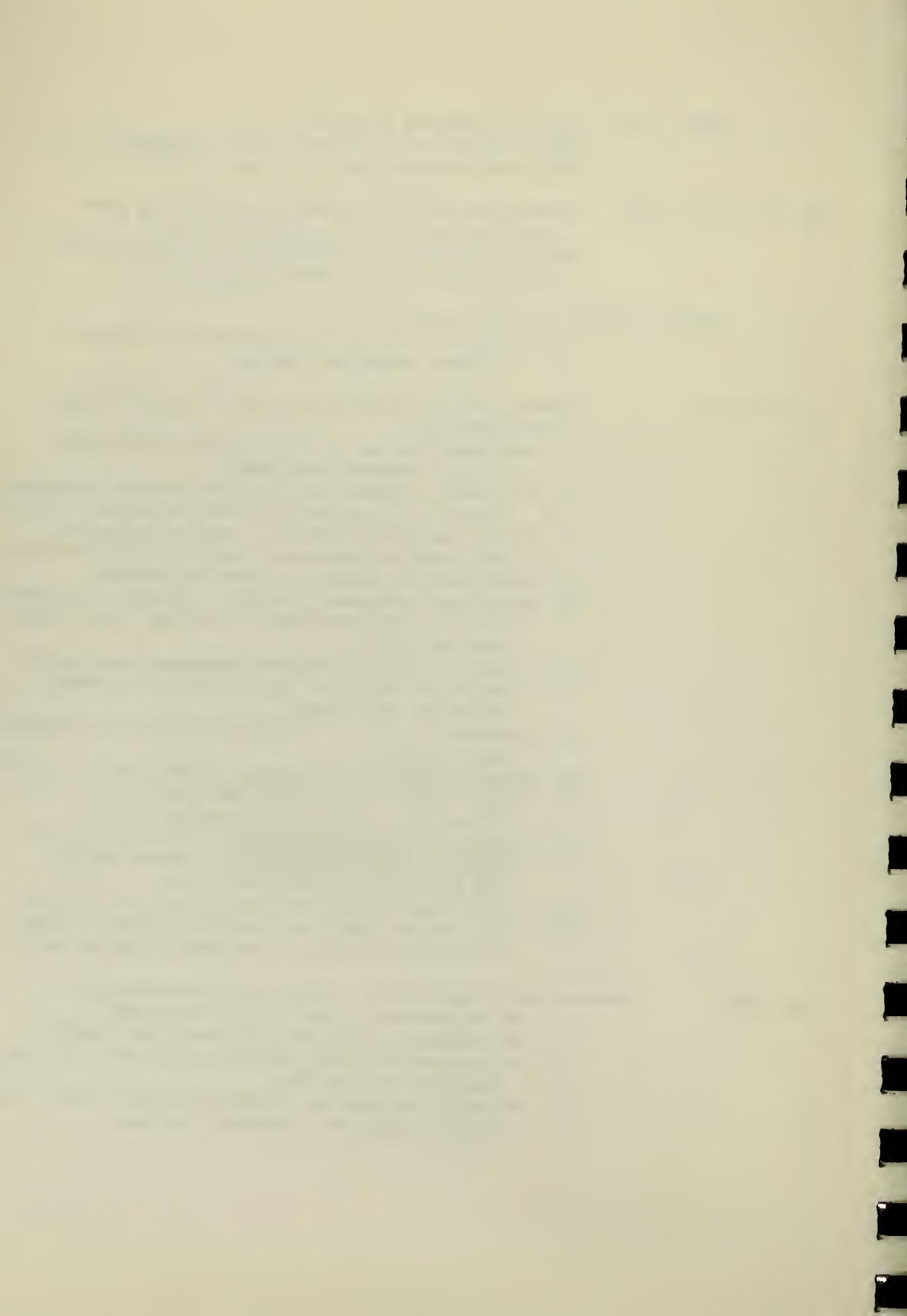
Between July 1, 1873 and July 1874 the following was completed:

- 1) Northeast Bastion service magazine (for Guns 1 and 2) masonry completed.
- 2) Southeast, South and southwest service magazines (Guns 4-9); wing walls, lintels and caps added.
- 3) 3/4 of sand-shell cover of service magazines completed on northeast, southeast and southwest
- 4) South service magazine graded and sodded.
- 5) Sally port bombproof gallery: concrete completed on east side; completed to spring line on west side for 20 ft.
- 6) Sally port gallery between bombproof and parade raised to ref. 5'6" and earth fill on west raised to this level
- 7) Terreplein graded in Northwest Bastion and behind Guns 5 and 6
- 8) Parados behind 9, 10 and 11 raised from 0' to 14'
- 9) Timber platforms (6) laid for guns 2, 3, 4, 9, 10 and 11. Iron work coated with tar.
- 10) Temporary breast-height wall (sod reveted) for guns 9, 10 and 11 raised to planned height and partially filled with sand.
- 11) Brick breast-height wall built in front of Gun 1
- 12) Breast-height wall for positions 3 and 4 raised 6 in. above pintle plates and filled in solid.

pg. 208

Proposed work plan fiscal 1875 (July 1874-July 1875)

- 1) To lay masonry of sally port bombproof
- 2) To complete sally port and north face gallery
- 3) To complete and seed earth-covering of principal magazine in east face
- 4) To build and hand all magazine doors (except old storage magazine, northwest Bastion)



pg. 208 - July 17, 1874 - \$20,000 funded.

Dec. 20, 1874 - Crew turned out and during month:

pg. 209

- 1) Excavated foundations for sally port and casemate
- 2) Added fill to parapet and to southwest and west faces.

Jan. 1875

- 1) Sallyport and casemate excavation completed  
(Included in the rubble excavated was the masonry of the "Old Sally Port, Parade Walls, Ramp, Cistern and Breast-Height Walls.")  
New sally port to be as per Gillmore plan of Aug. 11 - Flanking casemates for peacetime guard detachment.
- 2) Cleaning out and relaying the tile in the drain leading from the Fort to the Cove (the section crossing Middle St. covered with flagging and joints cemented)
- 3) Remaining drift sand removed from entrance to main mag. and galleries.
- 4) 950 bbls. concrete and 46 T. granite received and stored.

Feb. 1875 -

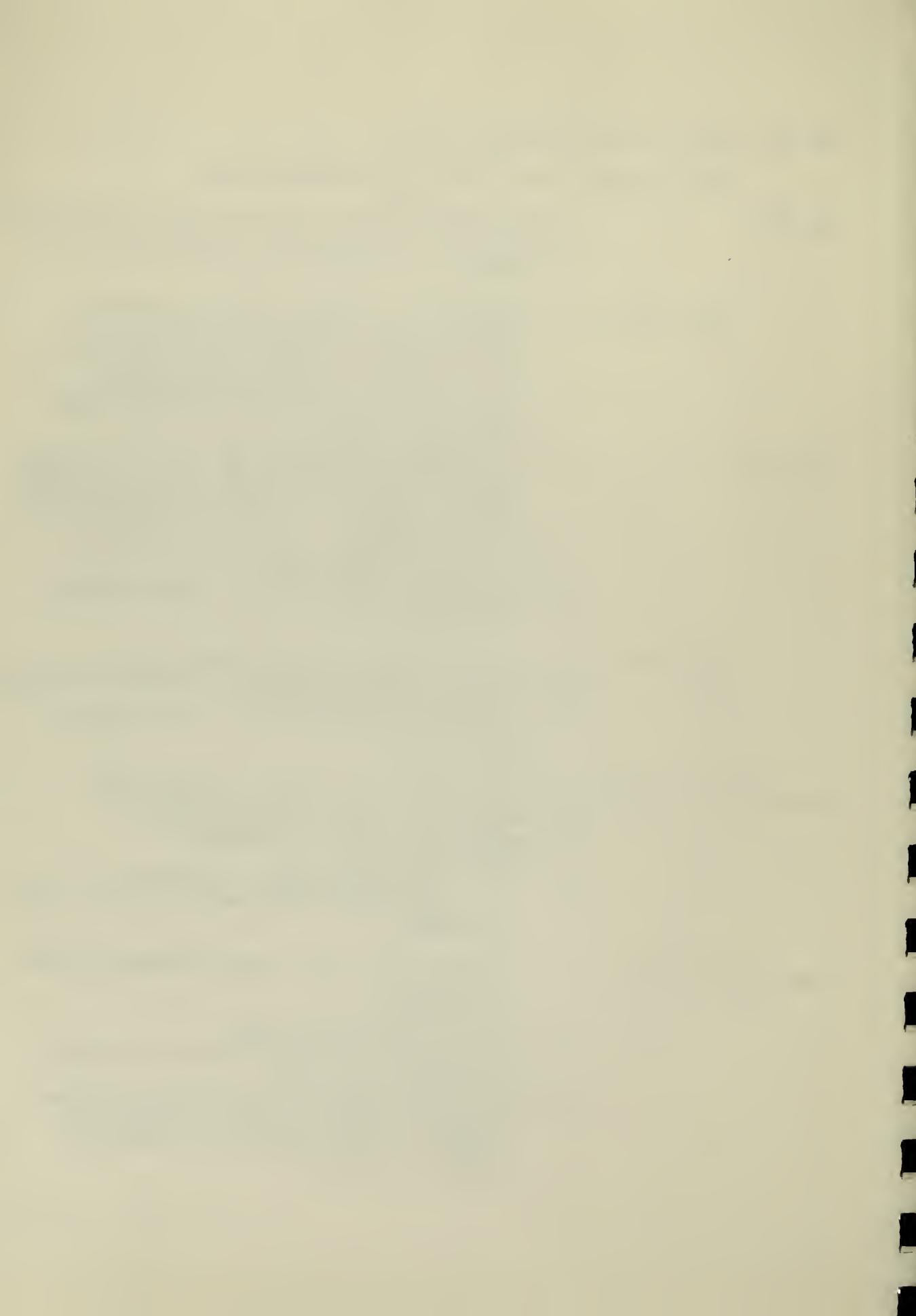
- 1) Principal Magazine repairs completed
- 2) Sally port and casemates conc. foundations poured.
- 3) (Other work on sally port)
- 4) West bombproof extended 20 ft. and raised to ref. 5' 6"

pg. 210 - Mar. 22, 1875 - Only masonry work undone as of this date:

- 1) Completion of sally port and bombproof
- 2) Remodeling old Mag. - NW Bastion
- 3) Const. Serv. Mag - " "
- 4) " Postern Passageway - NW Bastion
- 5) " Breast-Height wall and Gun Platform (#12) NW Bastion

pg. 211 - Mar. 1875

- 1) Sallyport and casemate fronts completed except for coping
- 2) (Other sallyport work...)
- 3) 61 ft. of bombproof erected
- 4) Plaster repaired in S. and SW service Mags. damaged by Jan. rains.
- 5) 80 cu. yds. sand fill added to principal mag. sally port and bomb proof and south face parapet. (S. face parapet also sodded and planted in clover)







pg. 215 - Jan. 1876    2) Completed foundations Gun 12 and Service Mag.  
                             (inc. steps)  
                             3) Raised walls of Serv. Mag. to ref. 8'6"

Feb. 1876 - 1) Completed Serv. Mag.  
                             2)         "     Gun 12 Platform  
                             3)         "     Lamp recesses and one doorway into the  
                             old storage mag.  
                             4) Pointed partition walls of the sally port and  
                             casemates.

Mar. 1876 - Work in old storage Mag. all month

- 1) Wooden flooring ripped out and 30 cu. yds. sand placed to raise floor level from 0' to 1 (1 ft.)

pg. 216 - Apr. 1876 - 1) Breast-Height wall of Gun 12 completed (except for coping)  
                             2) Remaining 75 ft. of gorge-face bombproof and connecting galleries raised to ref. 5'6"  
                             3) Postern galleries raised to ref. 6'  
                             4)         "     front completed  
                             5) 30 cu. yds. sod and earth placed over sally port, and casemates, old mag. and new service mag.  
                             6) 300 cu. yds. sand placed over principal mag.  
                             7) Drain cleaned  
                             8) Sally port and casemates plastered  
                             9) West casemate fitted out as storeroom for the ordnance sgt.  
 10) Reservation enclosed by white-washed picket fence.

pg. 216 - Also completed in the fiscal year:

- 1) Service Mag. and Old Storage Mag. except for doors and flooring. (The doors had been fashioned but not hung.)
- 2) Parade ent. of sally port reinforced with conc.
- 3) Postern entrance fenced
- 4) Sally port and Postern gates white-washed.

pg 217 - June 19, 1876 - Items required to complete Fort Moultrie:

1) Raising and coping scarp	\$ 1,450
2) Completing bombproof galleries	1,360
3) Postern and cross galleries	993
4) Side galleries in old magazine	120
5) Floors	560
6) Doors	1,290
7) Lamp closets	120
8) Sally port stairs	300



9)	Drain into the cove	\$ 1,000
10)	Stone platforms & breast-ht walls for 8 guns	25,025
11)	Platforms for 5 guns	250
12)	Sand filling for traverses (16,000 cu. yds.)	12,000
13)	Sand filling for face (10,000 cu.yd.)	7,500
14)	Sodding inside of fort (10,000 sq.yd.)	10,000
15)	Sodding face ( 5,000 sq. yd.)	5,000
		\$66,968

Funds not appropriated

pp. 219-240 - Fort Moultrie Allowed to Deteriorate - 1877

pg. 223 - June 12, 1870 - Bombproof fitted up as a storeroom

pg. 224 - Apr. 1878 - Gun platforms 5 and 6 rotted through

Autumn 1879 - Ordnance and platforms

pp. 224-225 Drains, descrip., cleaning, etc.

pg. 227 - Use of lacquer to combat rust

Mar. 16, 1881 - Report that the conc. over sally port and flank-casemates was suffering from exposure and needed protection by covering with boards.

pg. 228 - Proposal to brick east drain

pg. 229 - Feb. 1882 - Wood covering of principal magazine

pg. 230 - May 1883    1) Clean and repair drains  
                      2) Const. new brick drains  
                      3) Covered mags. and traverses with boards  
                      4) Resodded slopes where needed  
                      5) Built and hung temp. sally port gates  
                      6) Renewed wooden steps on the slopes

Ap. 17, 1883

Jas. P. Allen to Lt. Bailey

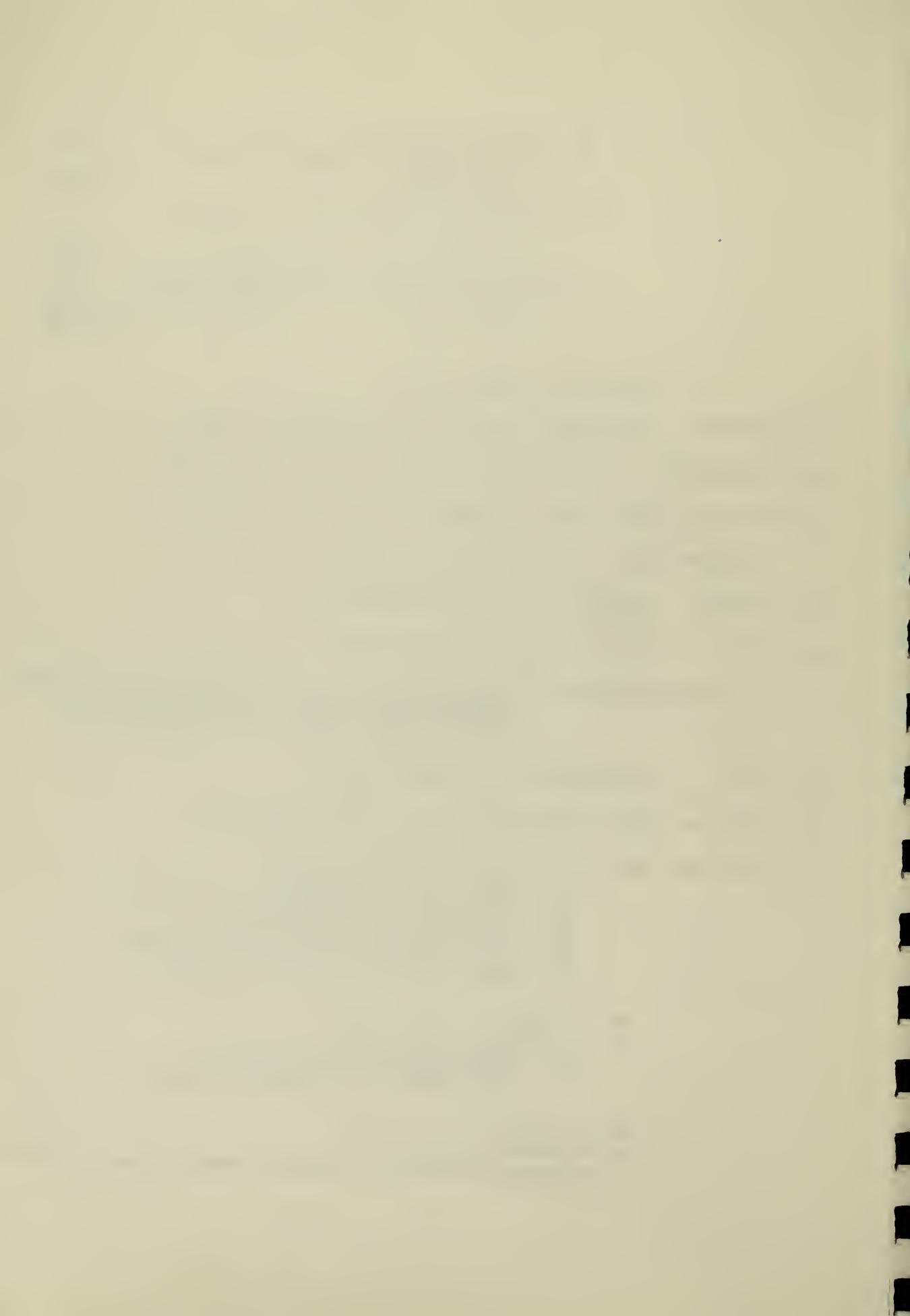
Re: platforms for 5, 6, 7 & 8

"using creosoted timbers as before."

May 23, 1883

David Keenan to Lt. Bailey

"...completed contract on FOMO and Parade Ground and cleaned out



old ditch, repaired it where needed. Covered it well with new 2 in. plank & built a new drain from N.E angle of Fort to intercept old one as per contract except that I used cement mortar instead of lime mortar... [laid in Portland Cement]. [Sodded 300 yds over slopes and over bombproofs.]"

pg. 231 - by July 1884 -

- 1) Slopes of principal mag. repaired, brought up to grade and sodded

pg. 223 - Aug. 31, 1884 - Principal mag. in "poor condition" because of dampness causing the powder to cake.

Pg. 234 - June 9, 1884 - The north face of the Fort covered with moss - rec. to be scarped and lime-washed  
The only serviceable platform was for Gun 12

pp. 234-5                          Estimates on renewing gun platforms and other work  
                                        Guns at the fort and their positions

pg. 237 - Nov. 29, 1887 -

- 1) The wooden roofing of the arched concrete passageway from the sally port to the parade has rotted and fallen, causing water to filter through the concrete. Otherwise the sally port and gallery are in good order.
- 2) The wooden platform of Gun No. 1 in each bastion, is unserviceable. The breast height walls are in good order. The parapet requires filling and sodding.
- 3) The gallery between guns 1 and 2 is in good order. The magazine leading from the same is in good order, and dry. It needs door and floor.
- 4) The wooden platform of gun No. 2 is unserviceable. This gun needs breast height walls.
- 5) The gallery between gun 2 and sally port gallery is in good order.
- 6) The service magazine leading from it is dry, but needs door and floor.
- 7) The large storage magazine has no door. The temporary floor



(wooden) has rotted out. The powder stored in it is fluid with water, partly due to sweating, and partly to infiltration through the arch. No cracks are visible. The part of the passage way from this magazine to the sally port near the latter needs flooring.

- 8) The wooden platforms of guns 3 and 4 are unserviceable. They need breast height walls, and the parapet needs filling and sodding.
- 9) The gallery leading from gun 4 to gun 5 is in good order. The magazine leading from this gallery is in good order, but needs a door.
- 10) The platforms of guns 5 and 6 are unserviceable. The sod revetment of the parapet has crumbled away, and the latter needs grading and sodding.
- 11) The magazine between guns 6 and 7 is in good order and dry, but needs a door.
- 12) The face cover of the scarp wall on sea face has been largely blown away by the wind.
- 13) The wooden platforms of guns 7 and 8 are unserviceable. The sod revetment of the parapet has crumbled. The parapet needs grading and sodding.
- 14) The wooden platforms of guns 9, 10 and 11, are unserviceable. The sod revetment of the parapet has crumbled. The parapet needs grading and sodding.
- 15) The magazine for this battery has no cracks, but is very damp and needs a door.
- 16) The platform of gun 12 is serviceable. The breast height walls are in good order. The parapet needs grading and sodding.
- 17) The service magazine for this gun has no cracks. It is damp, probably from sweating. It needs door and floor.
- 18) The large storage magazine in this bastion, wants door and floor. It is reasonably dry.
- 19) The gallery to the right of the sally port gallery is dry and in good order.



- 20) The guard room to the East of sally port gallery is dry and in good order.
- 21) The guard room to the west of the same is damp due to the water seeping through from above, where the wooden roof over the concrete arch has fallen.
- 22) The whole fort is overgrown with huge weeds. All the slopes are in bad order, and need proper expenditures for care and repairs.
- 23) The mortar battery in rear of the fort is unserviceable from the rotting of the wooden mortar beds.
- 24) The fence round the parade ground in rear of fort is in a disgraceful condition. It is so rotten that nails will no longer hold the palings, and the parade is the grazing ground of any cattle that roam the island.
- 25) The ordnance sergeants house is in reasonably good order. The Engineer cottage, occupied by Sergeant Concon, retired, needs repairs.
- 26) There are no cisterns in the fort itself.
- 27) The ordnance sergeant's quarters has a cistern containing when full about 2,000 gallons, and there is another connected with the cottage capable of holding about 10,000 gallons.
- 28) This includes all the known water supply of the fort.





PHOTO I

Aerial View - Fort Moultrie

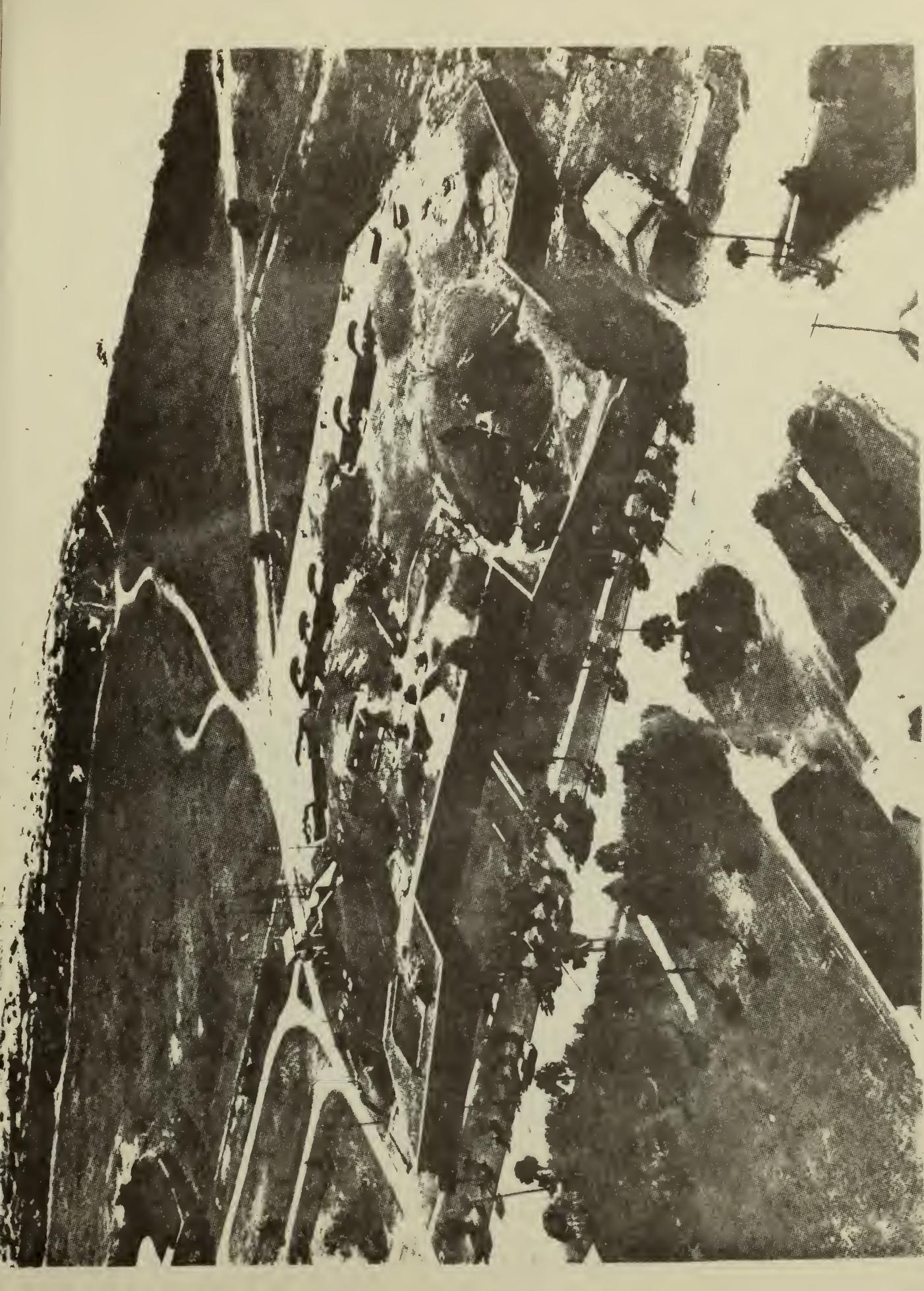






PHOTO 2

Northeast Angle of Southeast Salient  
Showing Area Requiring Repair

PHOTO 3

Typical Deterioration of Mortar Joints

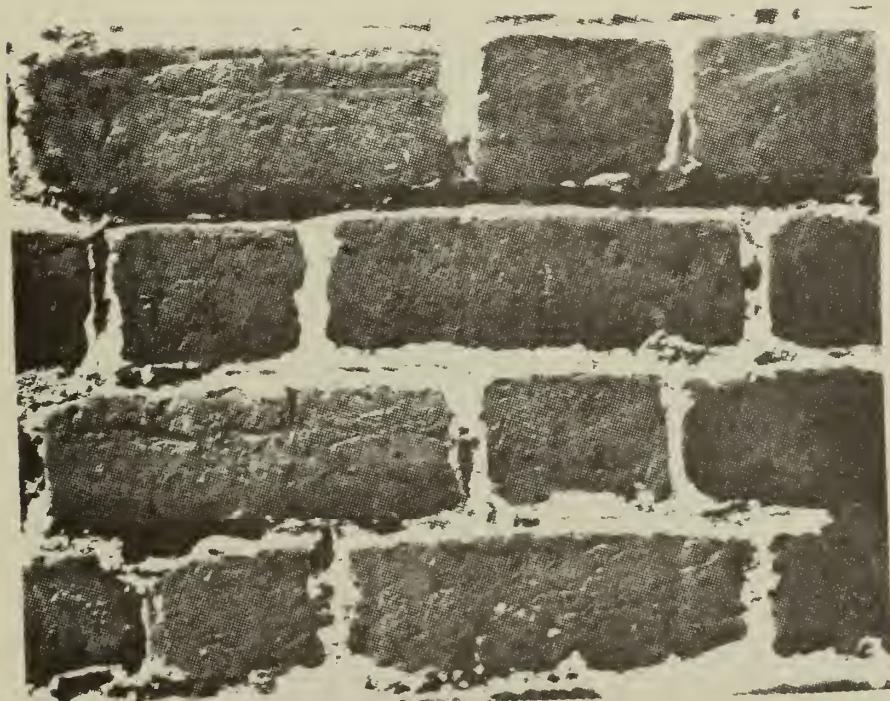
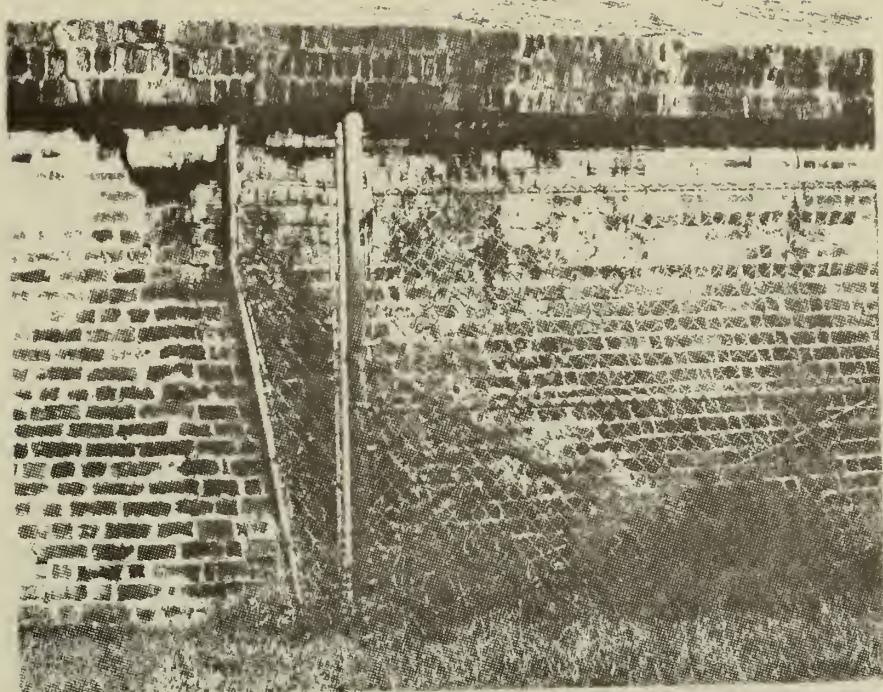






PHOTO 4

North Wing Wall of Northeast Bastion Service Magazine  
Typical of Stucco Patching Required on the 1872-1876 Constructions.  
Note Brick Wall to Right: Typical Pointing of 1872-1876 Period

PHOTO 5

Deterioration of Concrete Surfaces of Sally Port

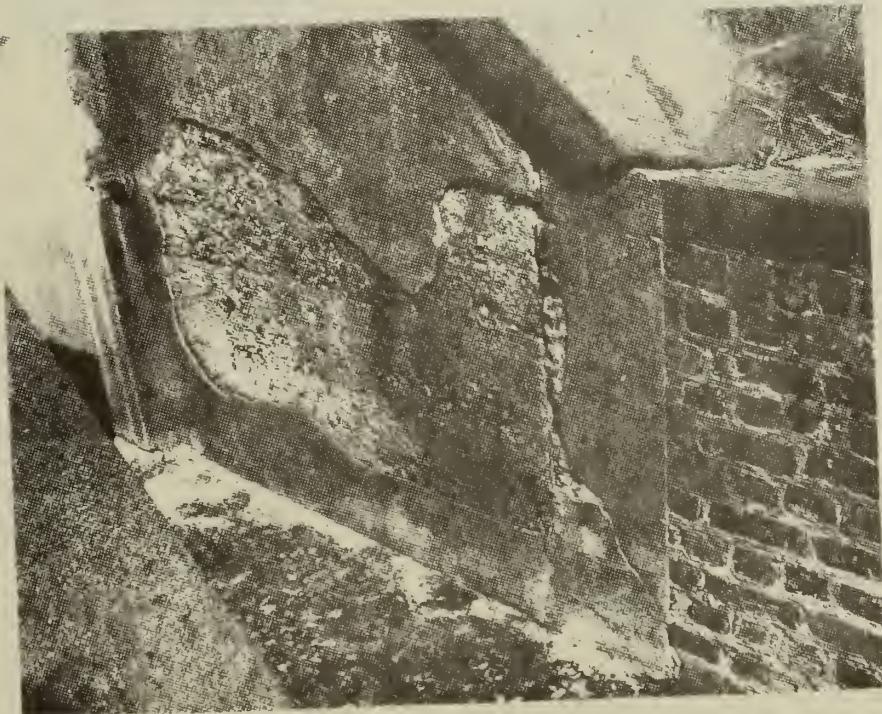
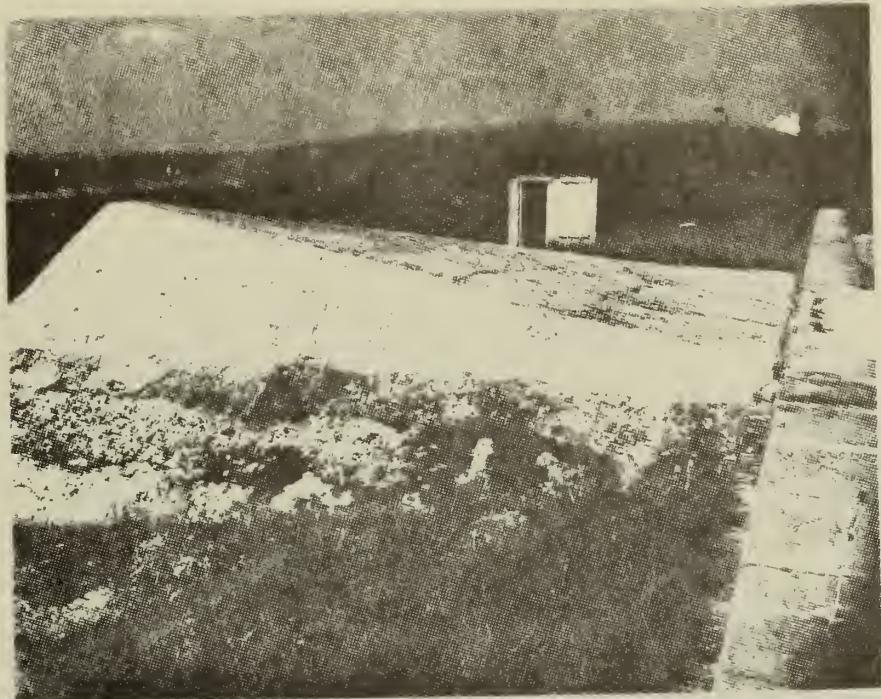






PHOTO 6  
Surface Deterioration of Exposed  
Service Magazine Roof

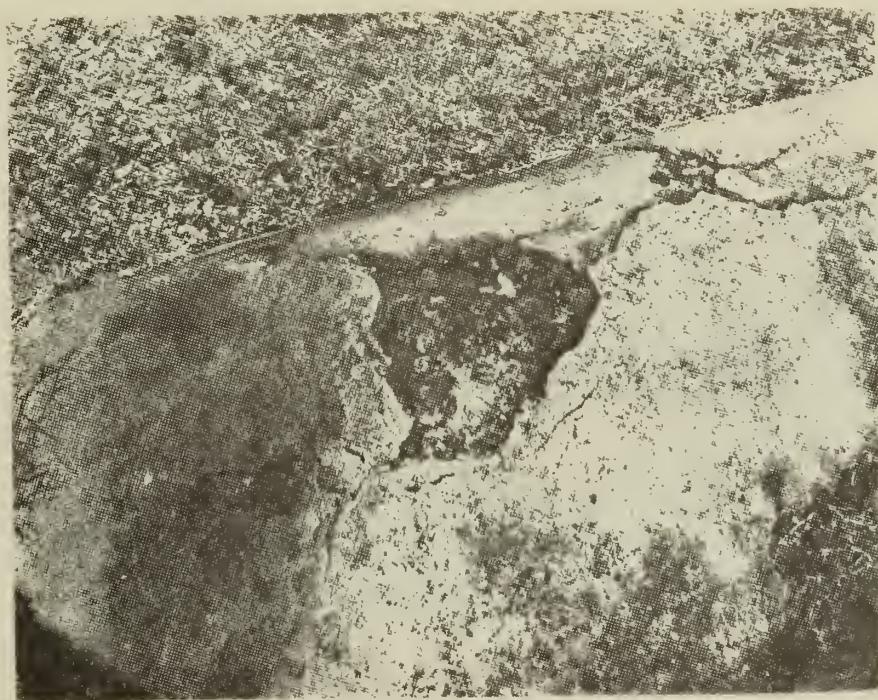






PHOTO 7  
Northeast Service Magazine  
Note Surrounding Slopes which Cause Water to Flow into Magazine

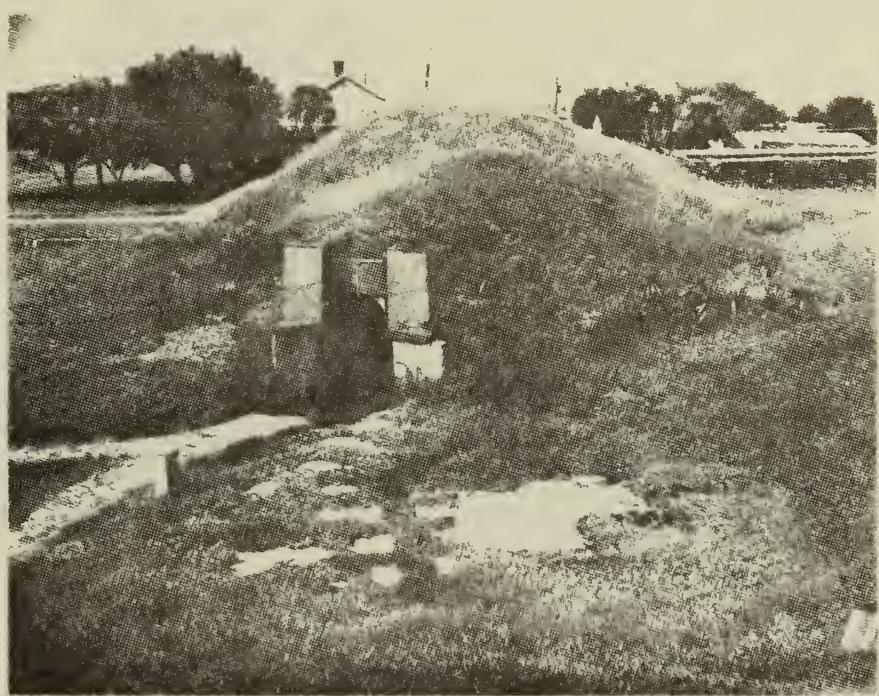






PHOTO 8  
Exfoliating Iron in the  
Old Storage Magazine Anteroom

PHOTO 9  
Battery Bingham in Foreground  
Battery McCorkle in Background

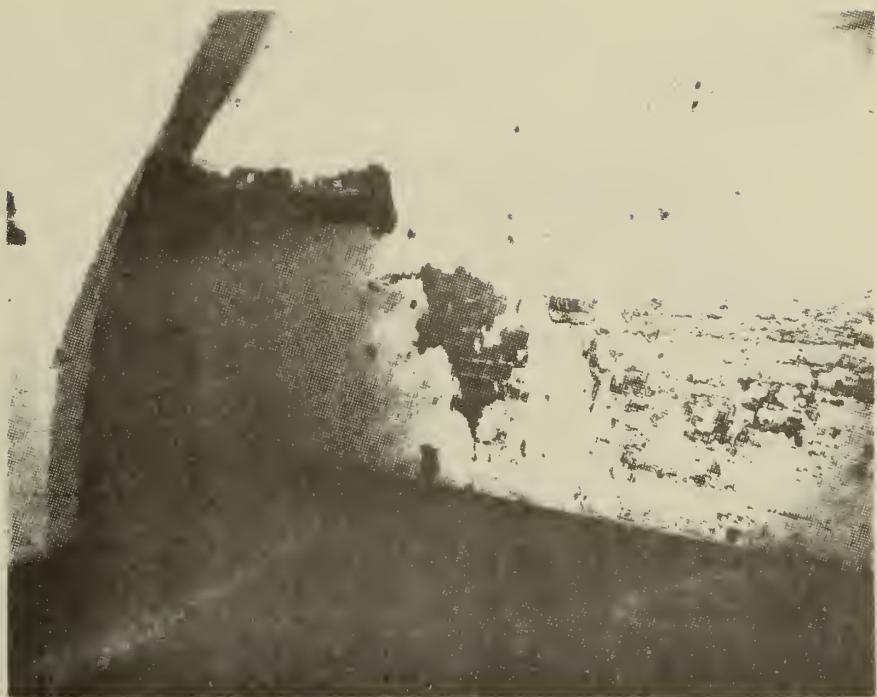






PHOTO 10  
Gun Position of Battery Bingham  
Condition Generally Good

PHOTO 11  
Battery Bingham and Blast Apron  
Note Surface Deterioration, Cracking and Subsidence,  
HECP/HDCP in Background

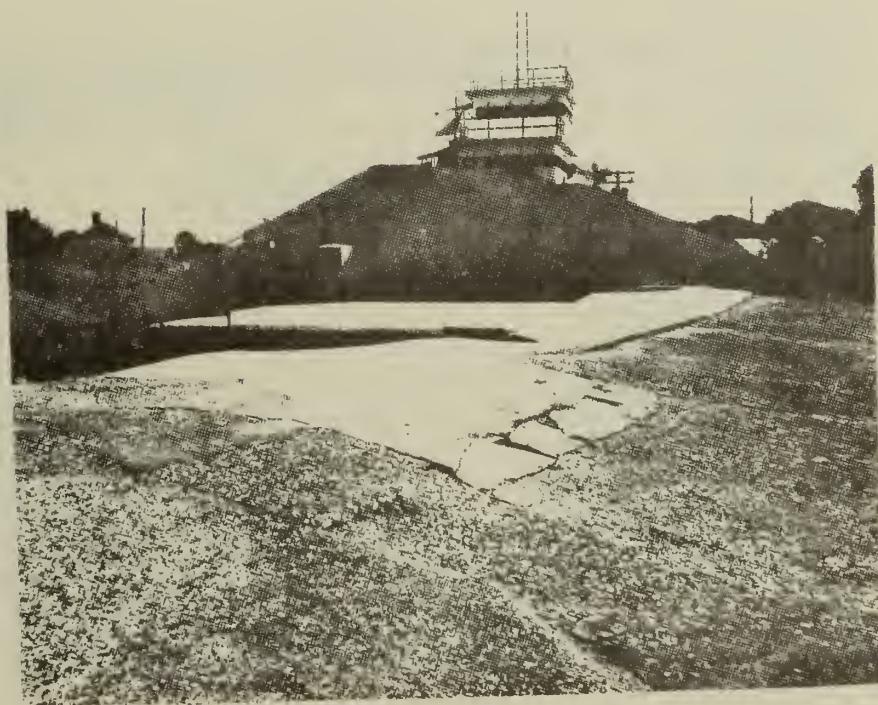
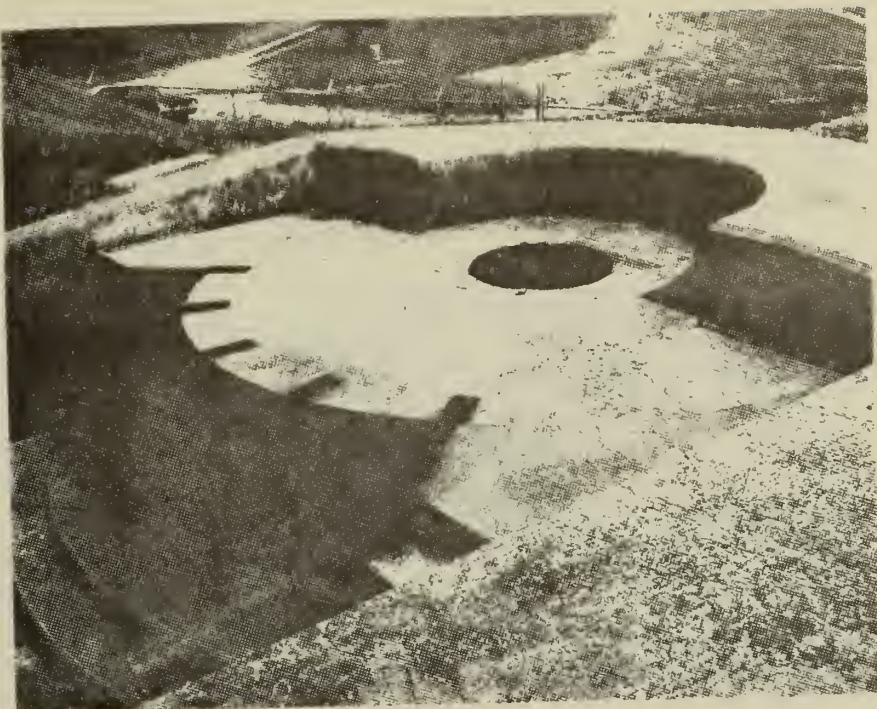






PHOTO 12

Battery McCorkle in Foreground. Note Remaining Original Smooth Surface  
in Lower Right Hand Margin.

Battery Bingham in immediate Background and Battery Jasper in Far Background

PHOTO 13

Battery Lord. Note Fractures in Horizontal Surfaces

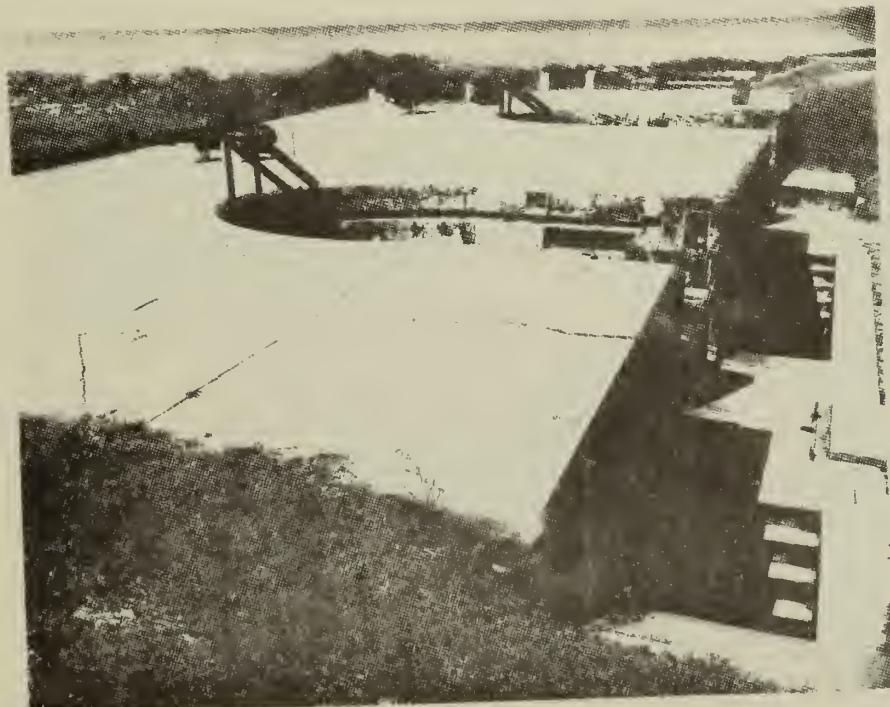
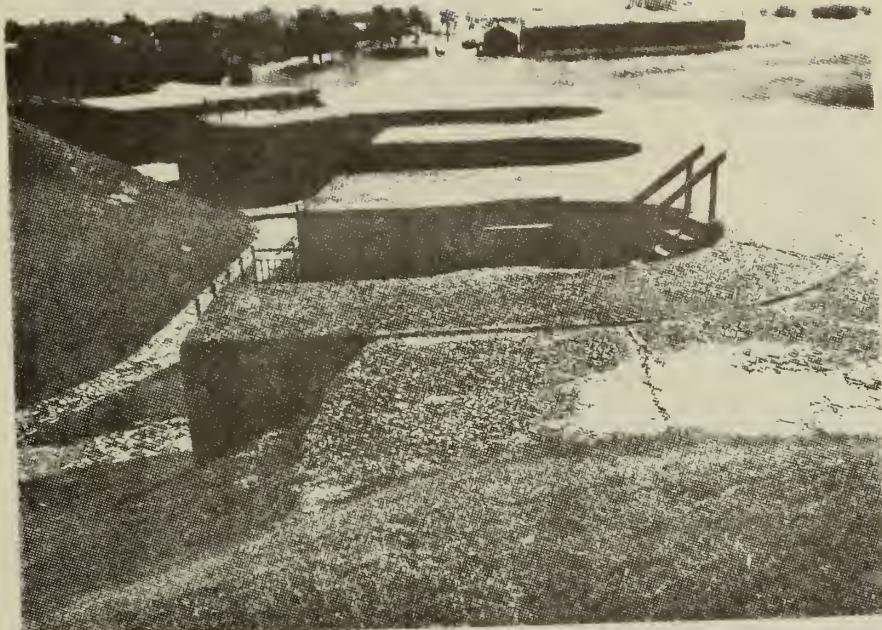






PHOTO 14  
Battery Lord - North Facade  
Note Numerous Horizontal Cold Joints and Calcium Formations Indicative of  
Leakage Problems

PHOTO 15  
Gun Position 1 - Northeast Bastion

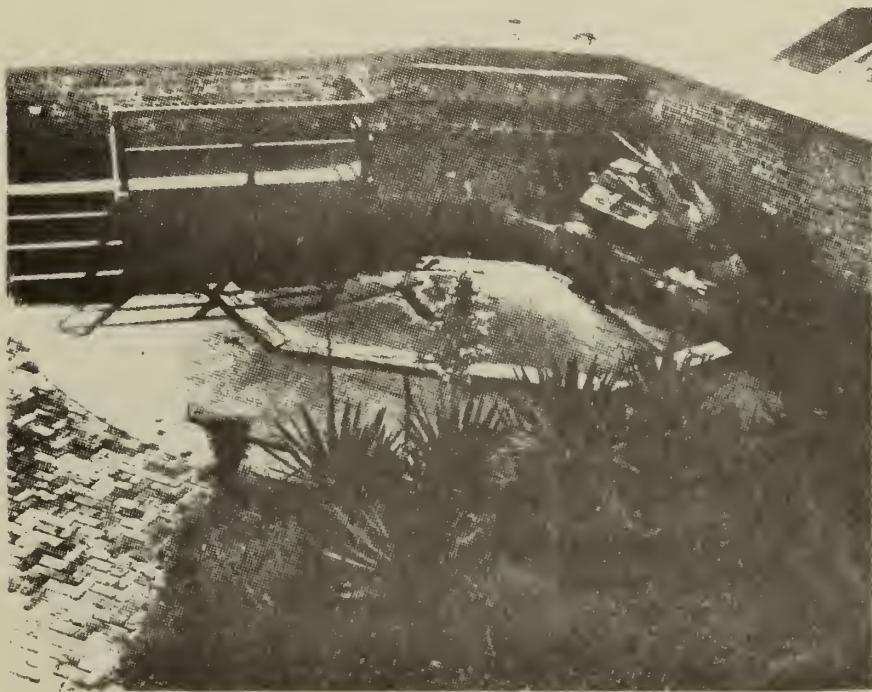
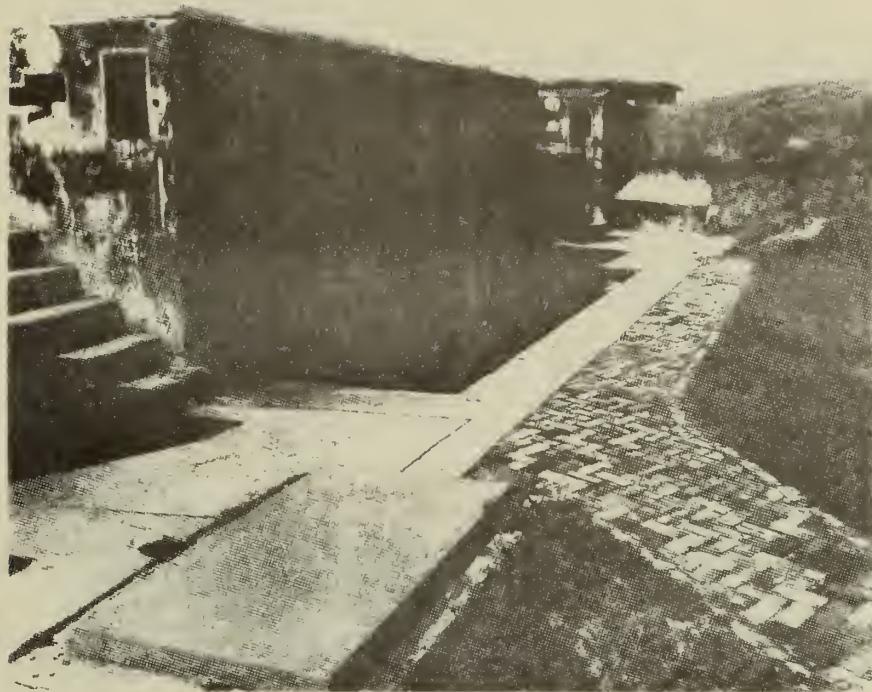






PHOTO 16  
Gun Position 12 - Northwest Bastion

PHOTO 17  
Gun Positions 9 (Pintle on Left) and 10  
Fort Sumter in Far Background

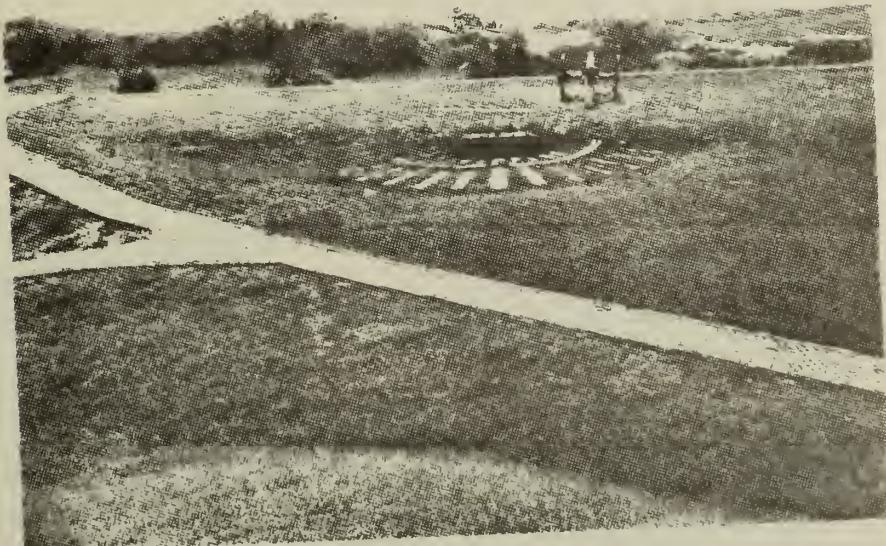
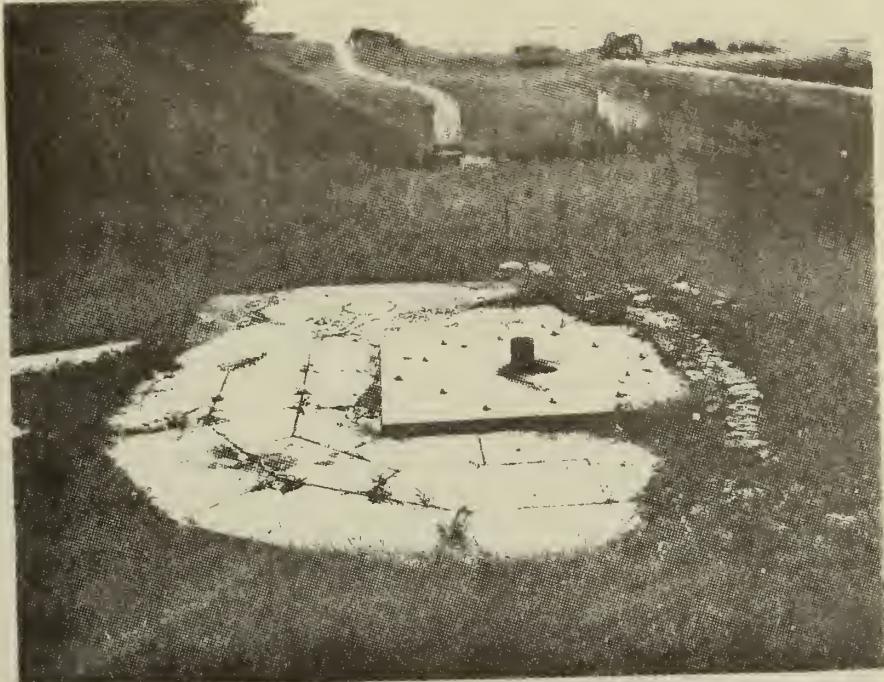






PHOTO 18  
Gun Position 10

PHOTO 19  
HECP/HDCP

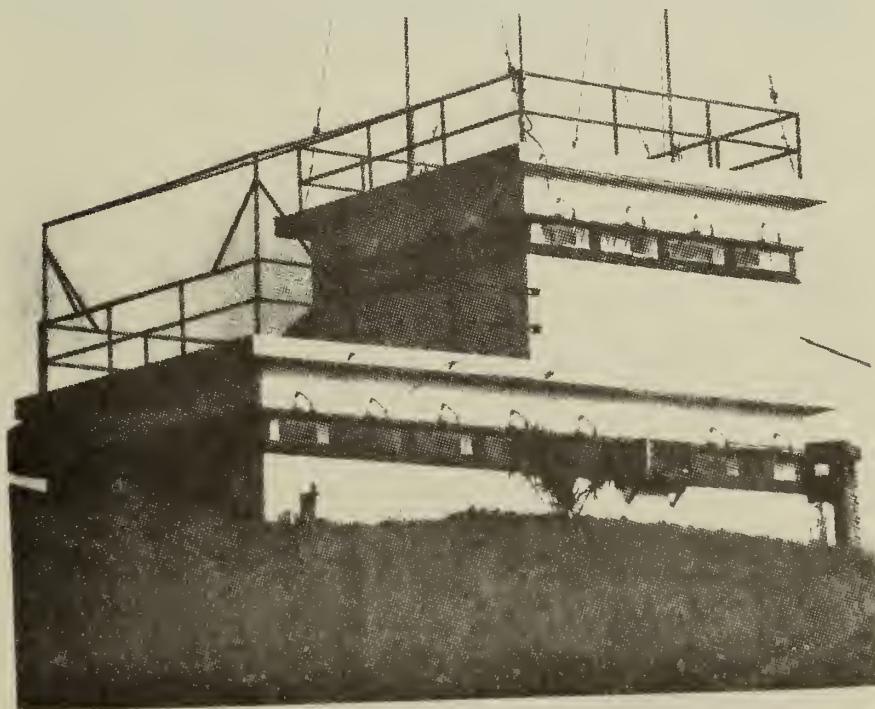
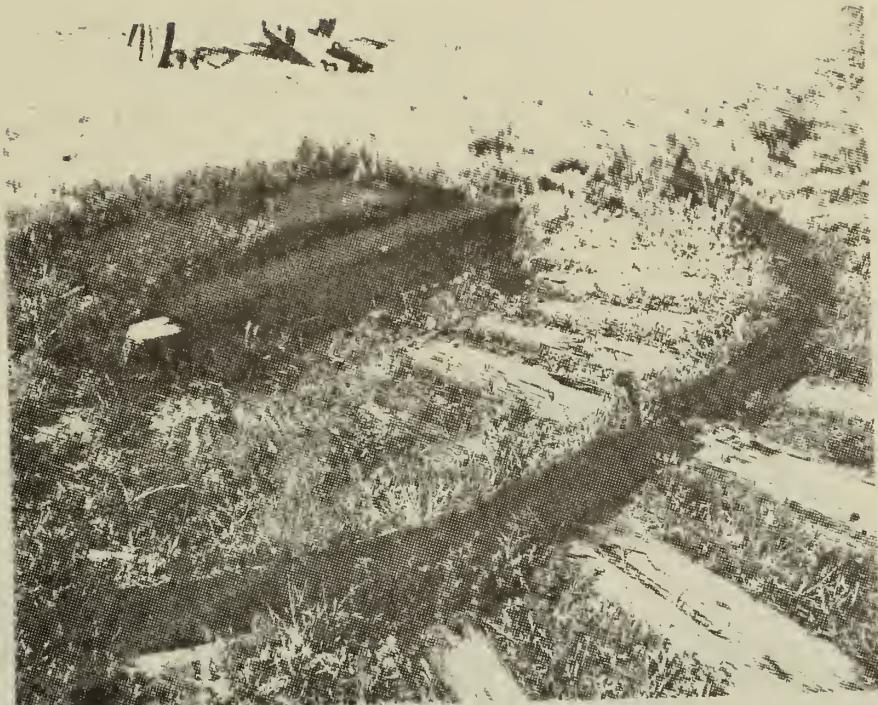


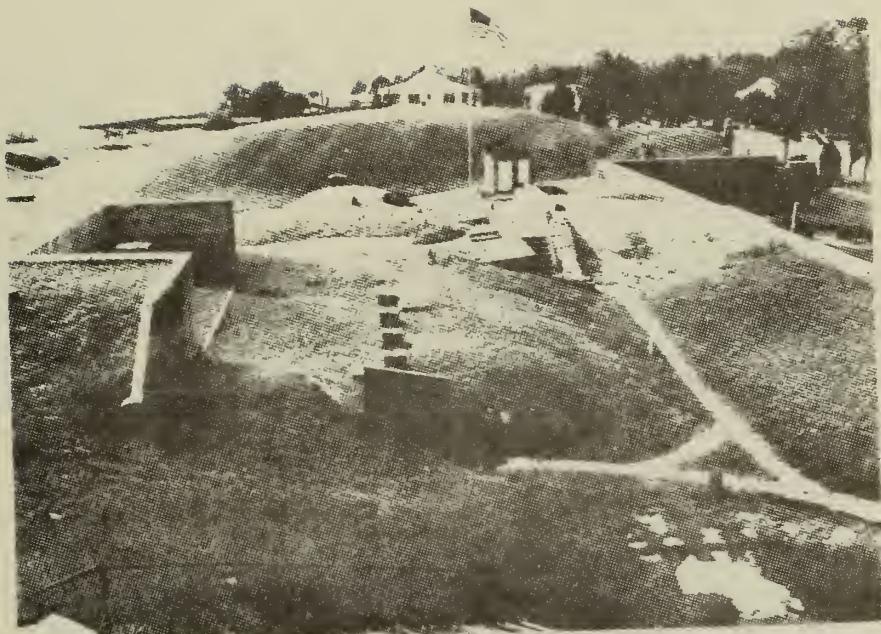




PHOTO 20

Looking West from Porch of HECP/HDCP  
Sally Port in Middle Ground;

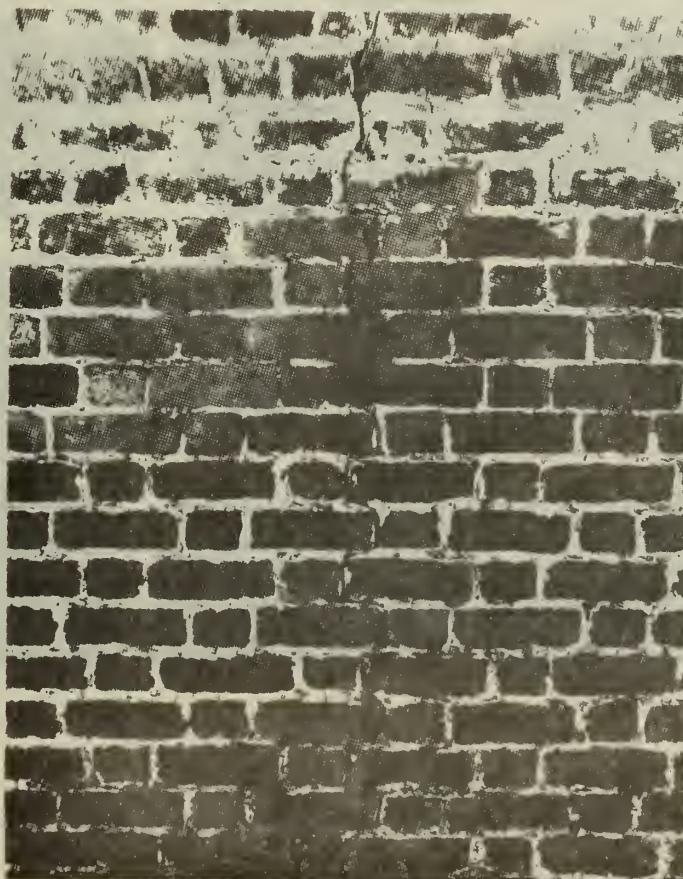
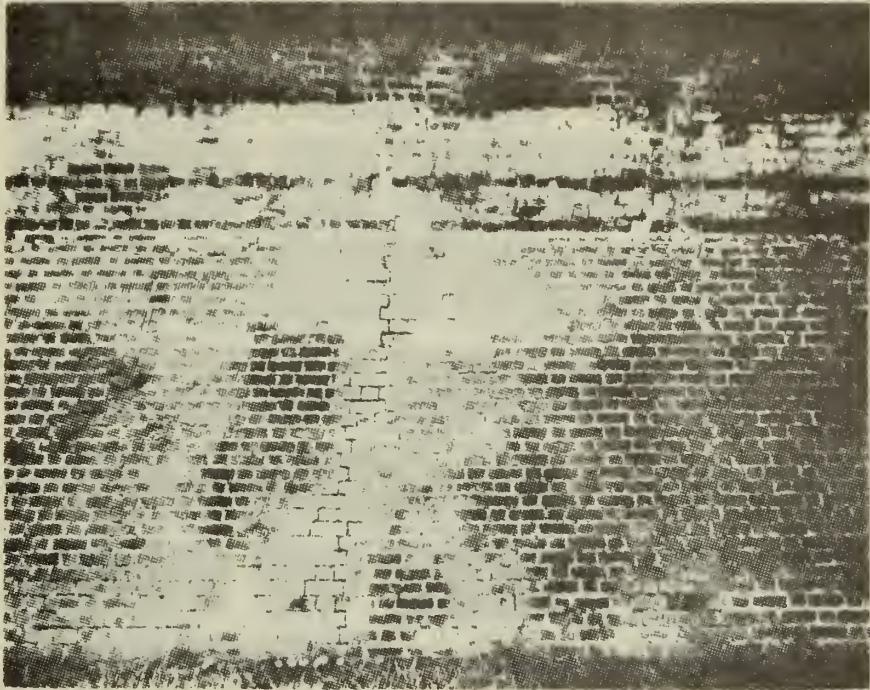
Old Storage Magazine is Under Large Earth Mound in Center Background



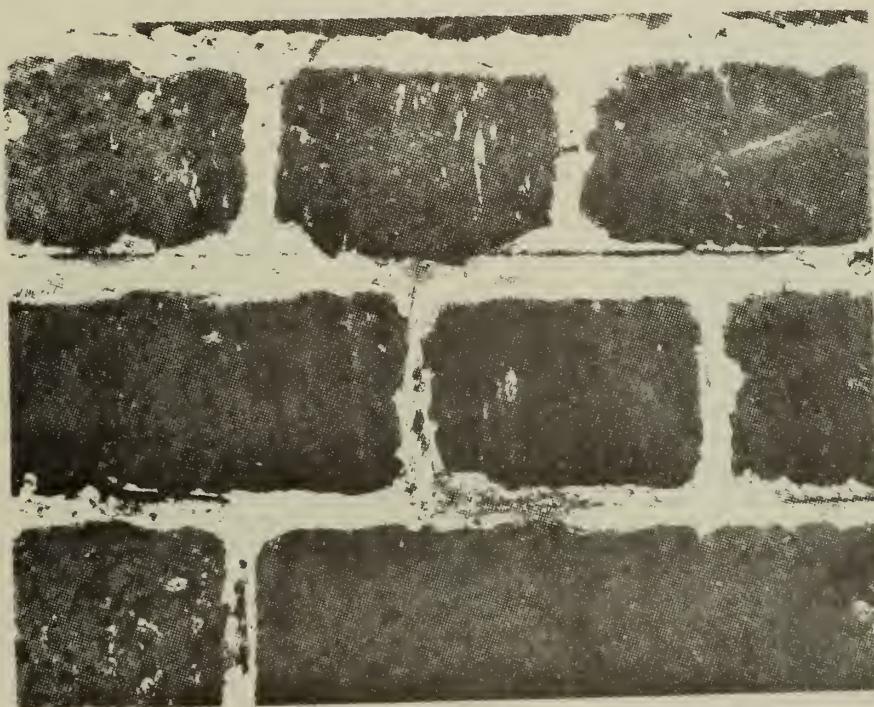
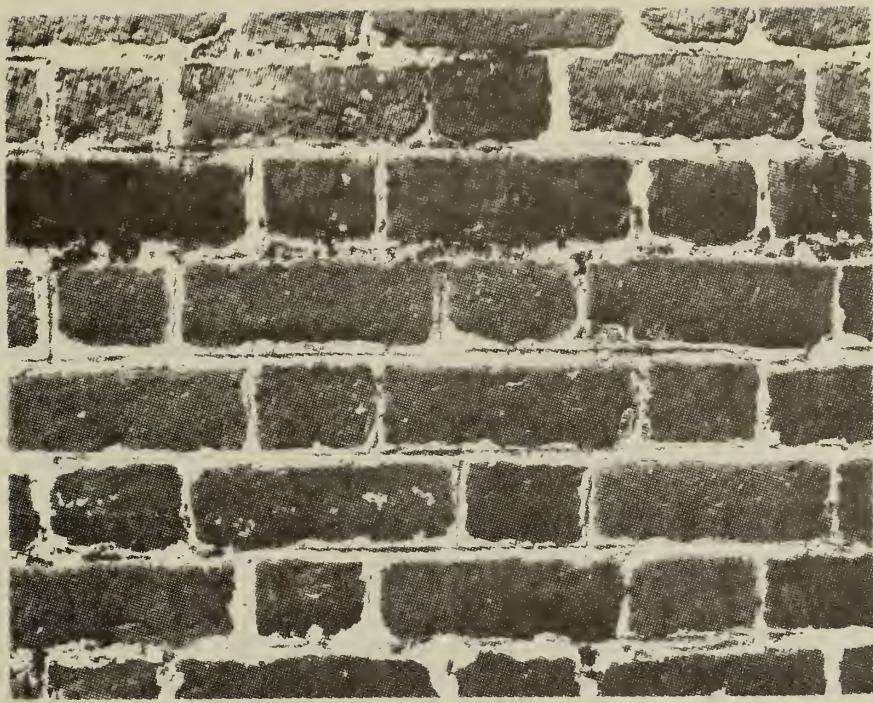




PHOTOS 21 and 21-A  
Typical Condition of Scarp Walls







PHOTOS 22 and 22 A  
Example of Pointing Dating to ca. 1830. Mortar is White Lime





PHOTO 23  
Entrance to Service Magazine 5 (Southwest Service Magazine)  
Note Fracture in Wing Wall

PHOTO 24  
Southwest Door Jamb of Service Magazine 5  
Fracture Caused by Foundation Settlement

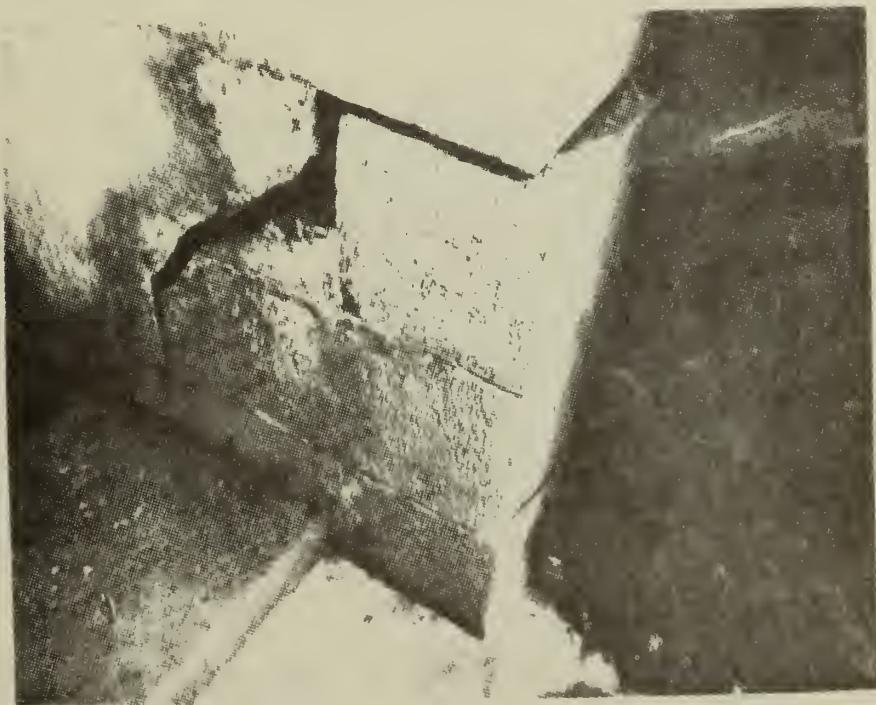
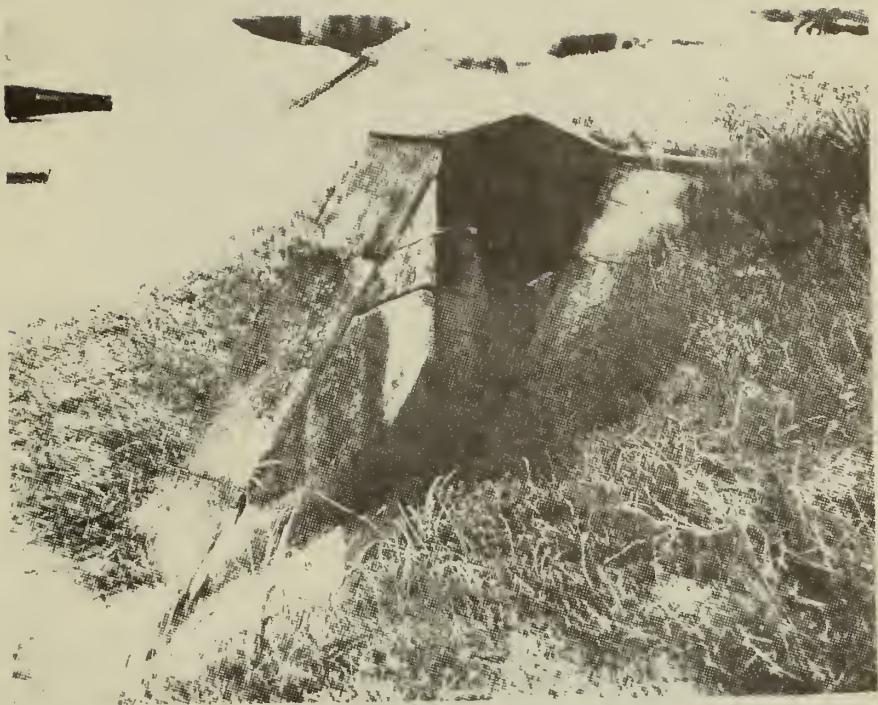






PHOTO 25

West Gallery, Old Storage Magazine, Looking North

PHOTO 26

Brick aggregate Concrete Surfacing, West Gallery, Old Storage Magazine

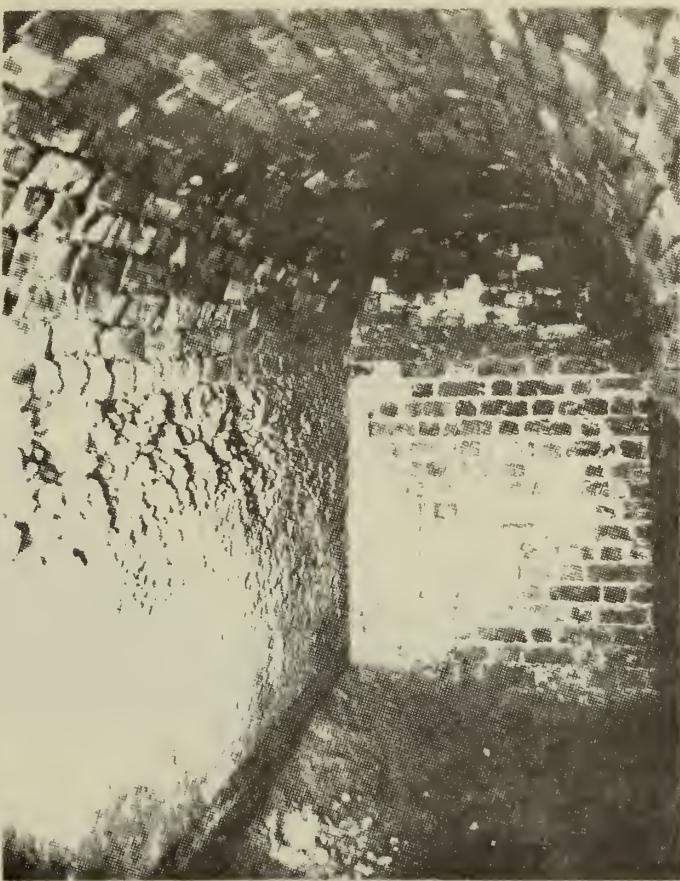






PHOTO 27  
HECP/HDCP Detail of Northeast Corner Showing Condition

PHOTO 28  
Traces of Stucco in Frieze of Cordon and above on East Face of Northeast Bastion

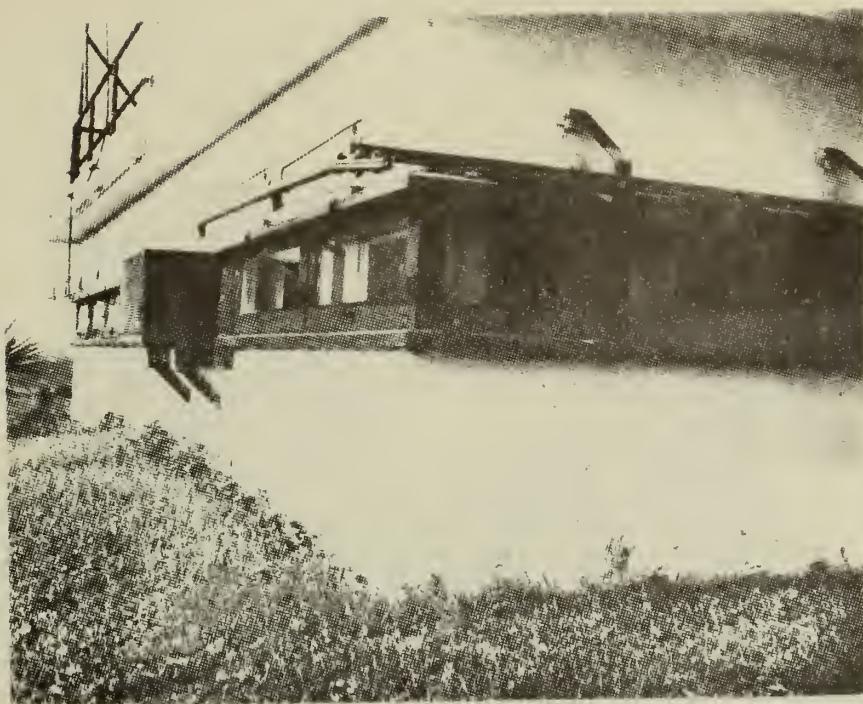
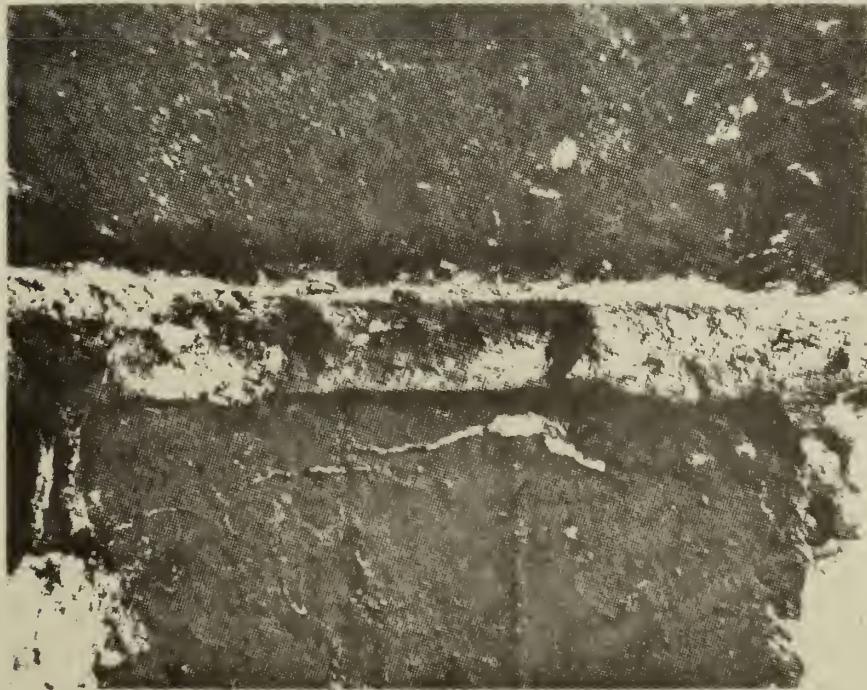
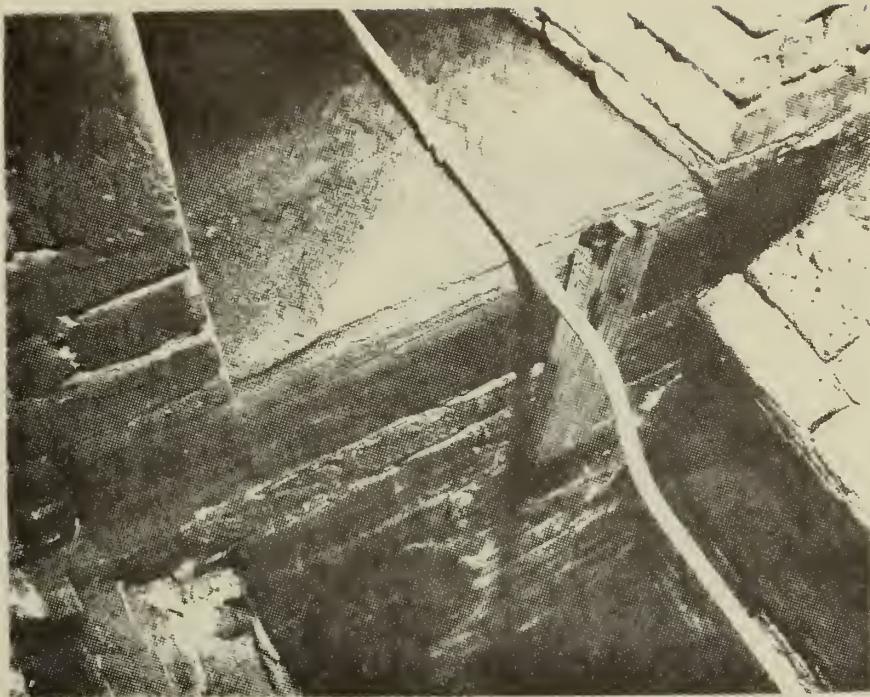






PHOTO 29  
Original 1808 Mortar Joint

PHOTO 30  
Red Free-Stone Lintel, North Opening of Old Storage Magazine



up scale down

TOP  
△





PHOTO 31

West Gallery of Old Storage Magazine Looking South  
Note Traces of Old Stucco (Dark Areas) and Original Buttresses

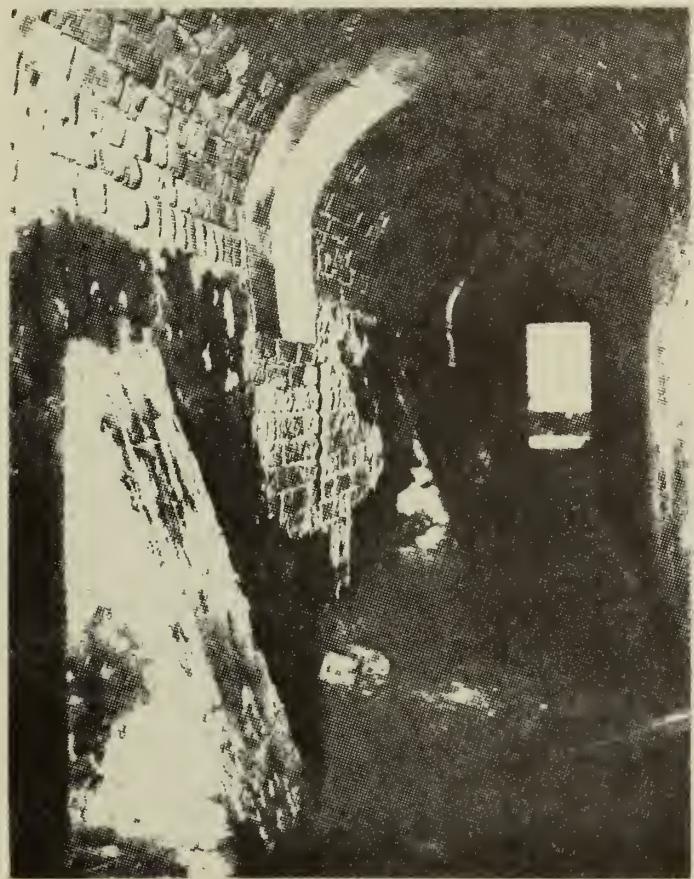






PHOTO 32

Old Pointing of North Wall of Old Storage Magazine

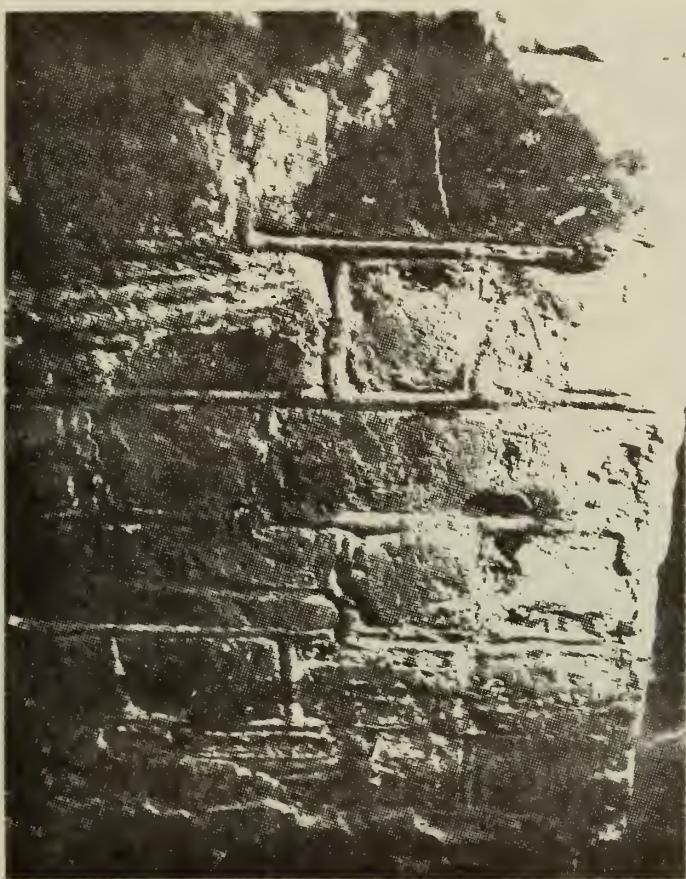






PHOTO 33

East Wall of Old Storage Magazine Anteroom, Looking East  
Portion of Wall Visible at Left Margin was Original Front (South) Wall  
of the Magazine

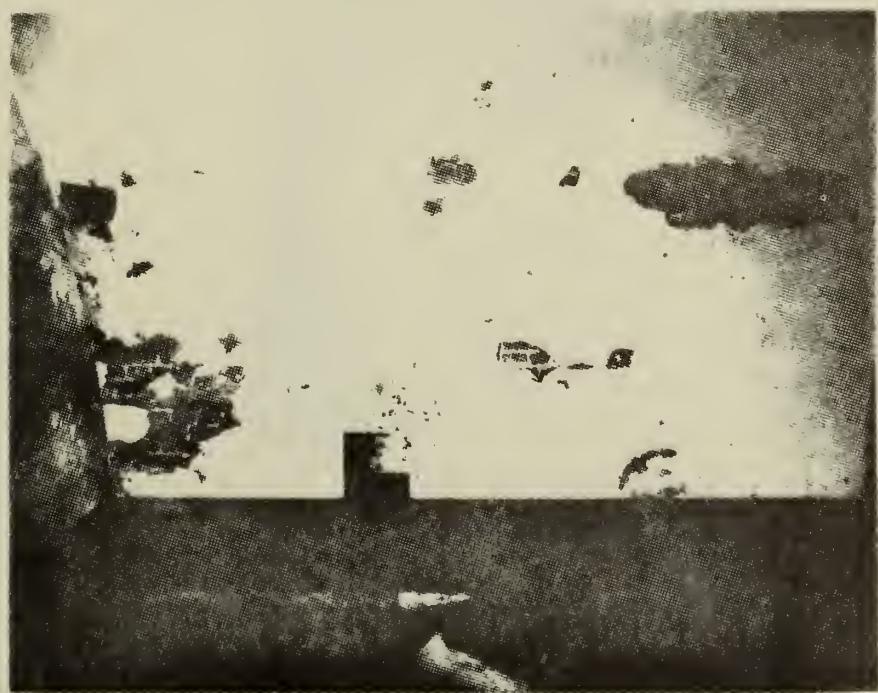






PHOTO 34  
East Wall at Center of Magazine

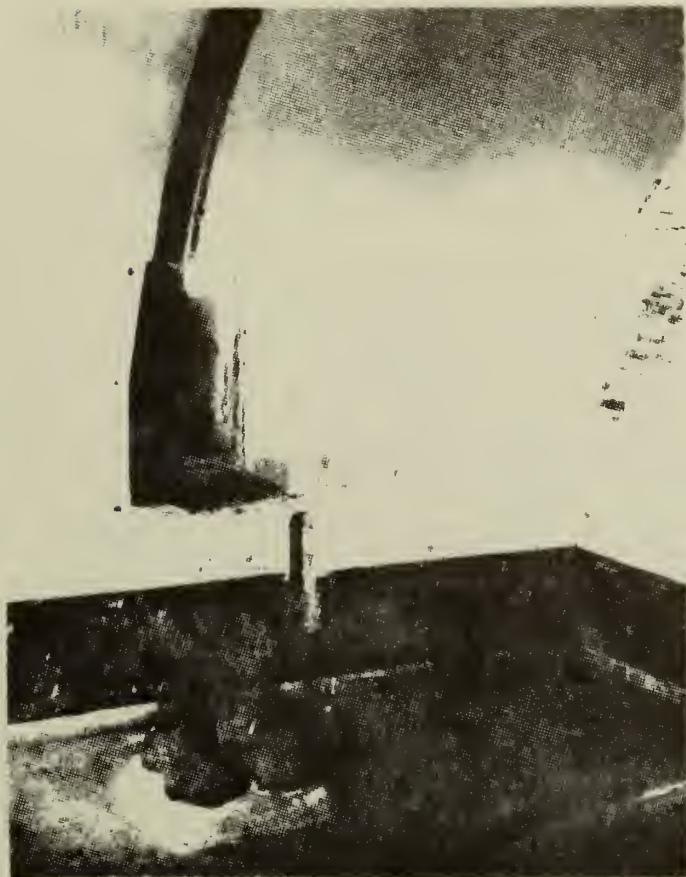






PHOTO 35

Magazine with Front Entrance in Far Background

